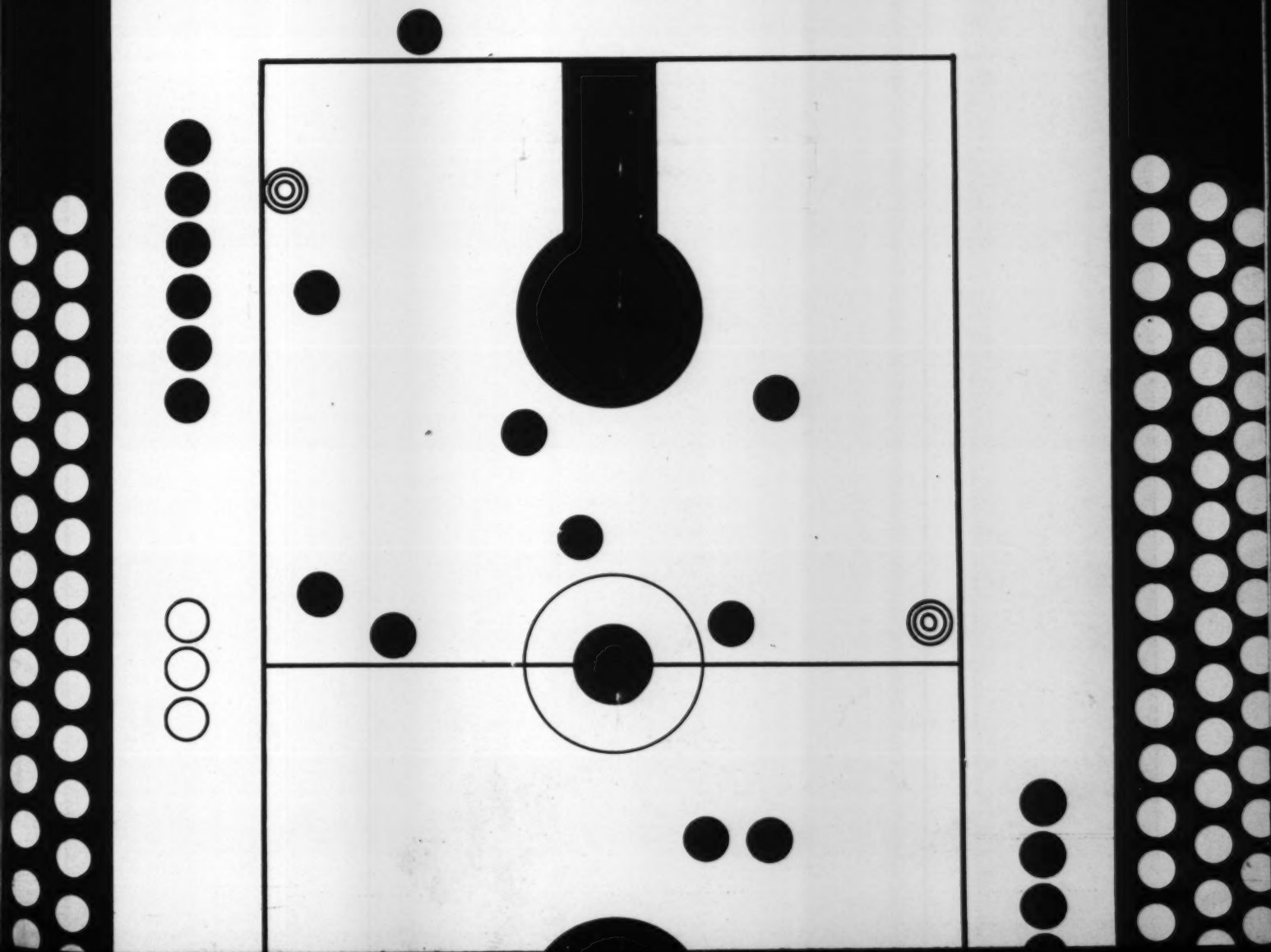


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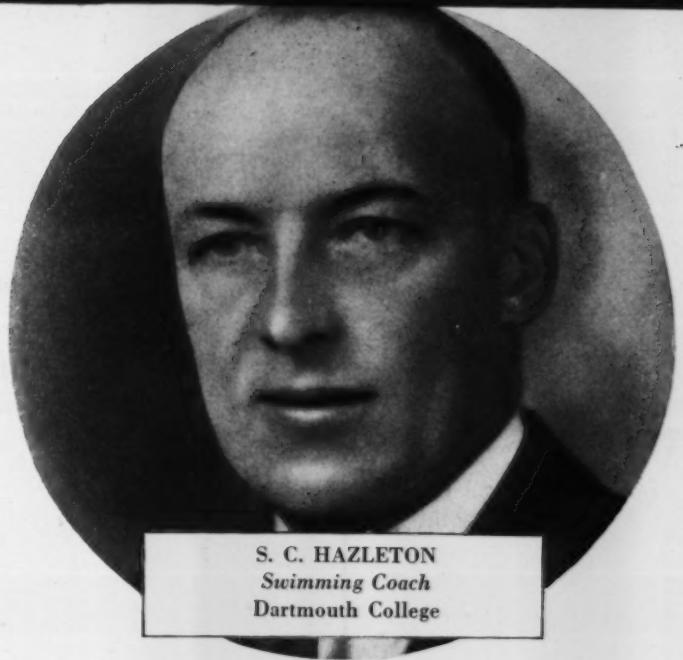


## POINTERS FROM COACH HAZLETON ON THE BACK STROKE

### THE BACK STROKE

The swimmer lies on his back and glides through water by alternating an over-arm stroke with a flutter kick similar to the regular flutter kick performed on the stomach. The head is held slightly forward and the body just barely bent from the hips. Knees and ankles are relaxed and toes are pointed in.

For the pull the arm pivots from the shoulder and sweeps downward in an arc to hip, with hand submerged no more than ten inches at the deepest point. While a straight arm pull generates more power than a bent arm pull, the arm is not naturally a rigid lever and swimmers may impair their flexibility and quickness. Individual experience will teach the degree of arm bend. Upon completing the pull, recovery is started by turning the palm from an inward to an outward position. The elbow moves forward as hand is lifted from water. When the elbow reaches its farthestmost position, the forearm is straightened and the catch is made a little to the side, affording a rest



S. C. HAZLETON  
Swimming Coach  
Dartmouth College

period for the muscles worked during the pull. The right arm should be halfway through the pull as left arm leaves water, and as the right completes the pull, left arm should be little more than halfway through the recovery. Some favor a straight-arm recovery as it eliminates bending and unbending motion of arm.

Much attention is demanded for the flutter kick. On the down beat toes should be extended down and out so as to provide the maximum bottom-of-the-foot surface for the beat against the water.



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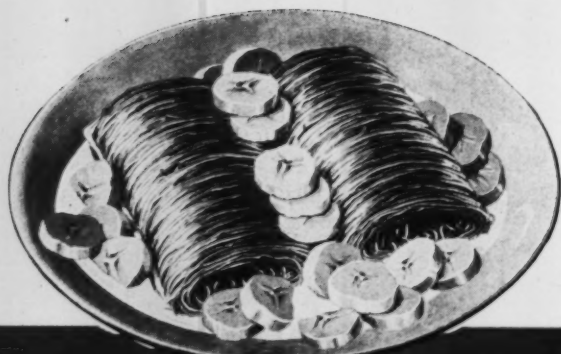
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# SCHOLASTIC COACH

Reg. U. S. Pat. Off.

IN THIS ISSUE VOL. 7, NO. 4

HERE BELOW .....	3
BASKETBALL WITHOUT THE CENTER JUMP..	5
By Sam Balter	
THE FIGURE 8.....	7
By William R. Wood	
THE UNIFIED ALL-COURT OFFENSE.....	8
By E. R. Purdy	
DEFENSIVE FOOTWORK (ACTION PHOTO-GRAPHS) .....	10
PLAY OF THE OFFENSIVE GUARDS.....	11
By Donald L. Trythall	
FROM THE STATES.....	12
THE PHILOSOPHY OF ATHLETICS.....	14
By E. B. Stansbury	
ICE HOCKEY FUNDAMENTALS AND TECHNIQUES .....	19
By George P. Geran	
QUARTERBACK'S TRIBULATIONS .....	20
By Ralph E. Hensley	
MEASUREMENT OF SWIMMING SKILL.....	22
By Peter V. Karpovich	
COACHES' CORNER .....	28
Conducted by Bill Wood	
NEW FILM, NEW BOOKS .....	29

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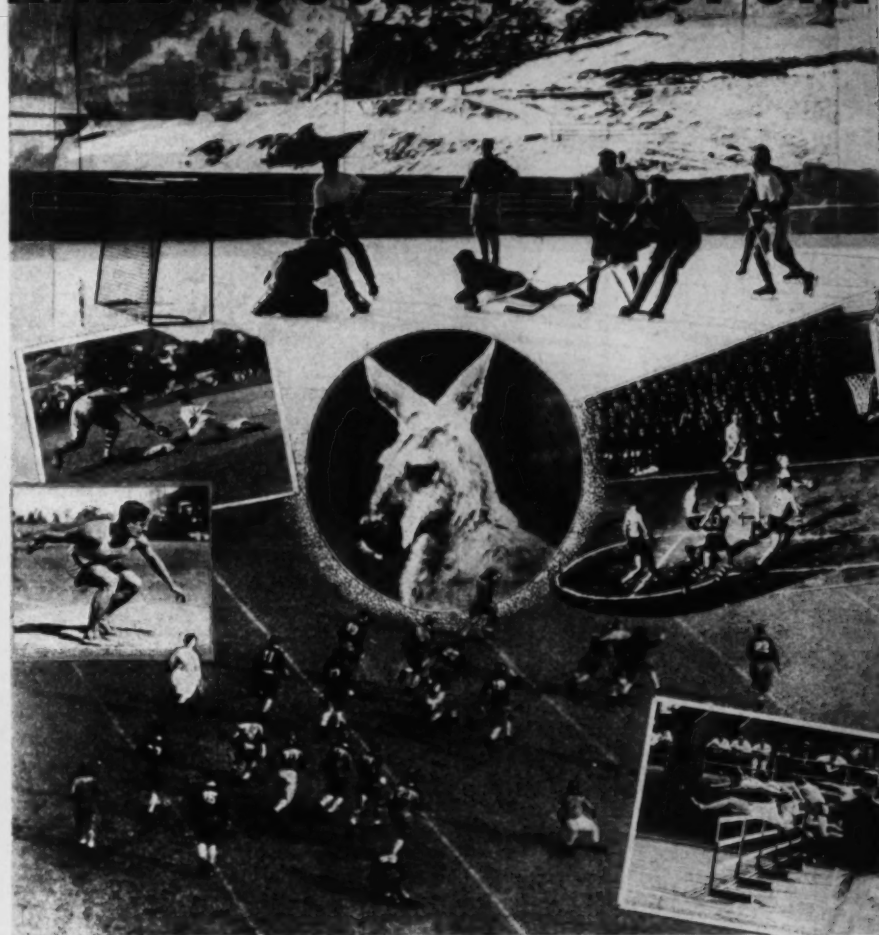
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## IN THE MAILBAG

### TO THE EDITOR:

The article, "We Don't Boo—Do You?," by Kenneth Cook of Connersville, Ind., High School in the October Scholastic Coach interested me deeply. I read it twice and feel that Mr. Cook should be complimented for a constructive piece of work. The article touches on a subject which has received considerable thought on my part and in which I am vitally interested. I refer to spectator conduct at athletic contests.

I will not venture an opinion here as to whether or not we are in need of a change in that conduct. However, I am firmly convinced that if we ever do face a necessity for a change, it is going to be made possible only through the education of the present adolescents. This is the prime reason for my interest in the Connersville article.

For a number of years there has been growing in this section a very forceful program of sportsmanship education. It has attained tremendous popularity considering its setting. I refer to the annual small high school basketball tournament of Massachusetts held at the state college in March.

This tournament, based on sportsmanship rather than championship, gives the boy of the small high school (enrollment under 500) an opportunity to participate in a tournament against players in his own class. Even the press, that hungry glutton of championships, does not attempt to attach any idea of superiority on the part of the winner.

The management of this affair rests in the hands of six headmasters of small high schools. The contestants are selected with the idea of evenly matching play, geographical representation in the four western counties and without consideration of schedules or past records. One new school is added each year.

Two games are played each night for five consecutive evenings, for which a student is charged ten cents, adults twenty-five cents and reserved seats, forty cents. All expenses of the competing schools are defrayed by the tournament committee.

It should be made clear that the Massachusetts State College is in no way officially connected with this annual tournament. Professor Harold M. Gore of the college, who originally conceived the idea of a small tournament to promote sportsmanship, is still acting in an advisory capacity to the committee, and Lawrence E. Briggs of the faculty is tournament manager, but all policies, precedents and administrative matters rest with the six headmasters.

HIRAM F. BATTEY,  
Principal, Deerfield High School,  
South Deerfield, Mass.

# Here Below

## Hot Stove Leaguers Take to Guessing Game. Hoopsters Play Hob With Three-Second Rule

**M**ORE FASCINATING to basketball men this season than "The Big Apple" is a guessing game born of basketball's latest rule change, the elimination of the center jump after field goals. The idea is to make up game situations where the offensive or defensive strategy is definitely affected by the new rule.

Take the long pop shot for example. Usually the shooter has two alternatives. He can follow up immediately for a rebound or hold his ground as safety man while his teammates do the job. Let us suppose that he attempts to drive in for the rebound. Heretofore if the guard was well coached, he would bar the path to the basket momentarily and then follow up the shot himself. But how does this strategy work out under the new rules?

The guard can now afford to gamble. Instead of impeding the progress of the shooter, the defensive man may actually encourage him to follow up the shot. As the shooter drives forward, the guard steps around him and breaks for the basket, taking a chance on one of his teammates recovering the ball. Even if the original shot is successful, the guard has everything to gain and nothing to lose. One of his teammates can grab the ball, step out of bounds and fling the ball to him deep in offensive territory. The shooter who has followed up is left under the basket with nothing to do.

In the second situation an offensive player is dribbling down the sideline under full steam and lets go at the basket without slackening his speed. The momentum from the dribble and shot will often send him hurtling over the end line and on to the floor. Let us suppose he makes the shot. While the shooter is still lying on the floor, the team just scored upon rushes the ball up the court and with

**T**O THOSE coaches who yearn for the days when the three-second rule was only a gleam in the rules makers' eye, we especially recommend the new film, "Basketball."

After the three-second rule drove the stationary pivot from under the basket, most coaches were forced to shift their pivot men to a position outside the free-throw lane or discard the pivot system entirely. As a result we have been seeing very little offensive basketball in the free-throw lane.

So you can imagine our amazement the other afternoon when for two reels lasting eighty minutes we watched two teams move in and out of the lane, set up plays and shoot as if the lane were a free parking area instead of *verboden* territory. At first



BASKETBALL IN THE '90's: Third down and five yards to go to the peach basket. A scene from an exhibition game in Madison Square Garden last winter by New York City Y.M.C.A. men.

a one man advantage over their opponents have better than an even chance of scoring.

The only recourse left open to the fallen hero after getting to his feet is not to limp futilely after the play, but to lay back under the basket and wait. If his four teammates can outmaneuver the offense and gain possession of the ball or even if the offense scores, the "sleeper" under the basket is in an ideal position for the pass-out. Of course the offense can keep a man back to cover the "sleeper" but this would make the odds under the basket four against four with no advantage to the offense.

In the past, the offense would concentrate on scoring, since play automatically stopped after a goal.

we thought the boys were abusing their three-second privileges, and every time a player moved into the lane we started counting, "one-thousand-and-one, one-thousand-and-two, etc." But never could we catch 'em in there for more than three seconds.

Of course the players—all members of the famous Phillips "66" Oilers of Oklahoma—had something (!) to do with it. With such players on the team as Chuck Hyatt, Joe Fortenberry, Jay Wallenstrom, Jack Ragland, and six others of similar caliber, you are sure to see something good. At one point we saw Fortenberry lift his 6 ft. 9 in. off the ground and spear a shot that was falling through the hoop!



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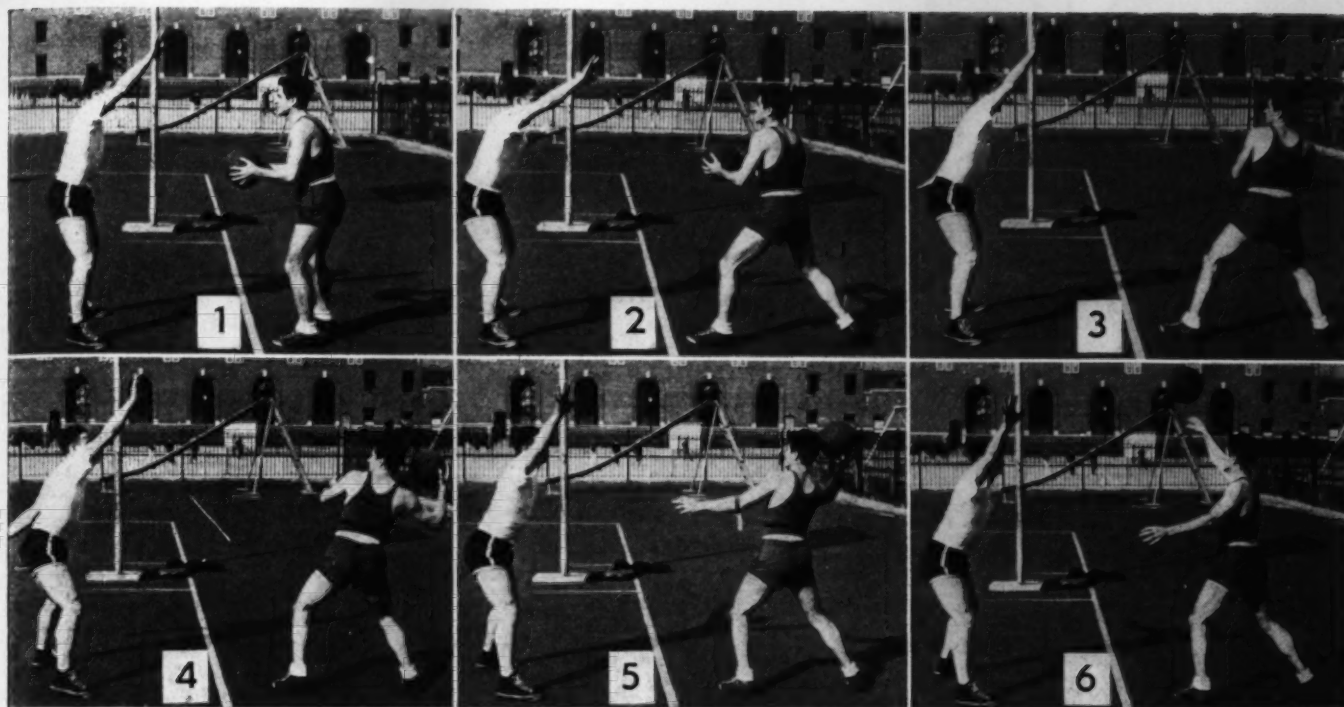
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After a field goal the defensive man wildly flags the ball-handler (out of bounds), but the latter steps back calmly and passes to the side.

# BASKETBALL WITHOUT THE CENTER JUMP

**By Sam Balter**

As a member of the 1936 United States Olympic and Universal Pictures basketball teams and as a radio reporter covering last season's Pacific Coast Conference games, Sam Balter has had an unusual opportunity to observe the effects of the elimination of the center jump on the game. While this rule was just put into the code this year, the Coast teams abandoned the jump at center after the 1934-35 season.

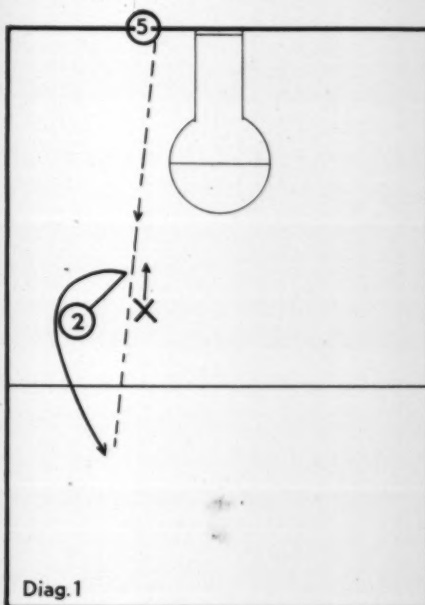
**W**HEN the rules makers drew the teeth out of the center jump, the ensuing flutter in coaching circles over the possibility of changes in offense and defense found Pacific Coast coaches unruffled. For basketball teams on the western larboard have been playing the game *sans* the jump at center since 1935-36.

Three seasons ago on the Coast there was an epidemic of pile-ups around the center jump. Play was exceedingly rough around the center circle and injuries were quite numerous. This is what really prompted coaches Sam Barry of U.S.C. and "Caddy" Works of U.C.L.A., to take up the cudgels for the elimination of the jump, plus the feeling of both that it would make for more actual playing time. A third factor involved, and perhaps the one most usually presented as the reason for the change in the rule, was the general conviction that an abnormally tall center gave his team an unjust advantage in controlling the tap.

Perhaps all this is treading on fa-

miliar ground. What is more important is the effect of the rule on actual playing tactics. First, and most important, the team that scores cannot relax after the basket; there is an immediate danger of a long, leading pass by an opponent to a fast breaking teammate.

A long pass half the length of the floor to a "hanging" forward may result in a 3-on-2 advantage over the defense. The University of California



### Diag. 1

If X2 is sucked in on this play and no teammate is in position to pick up 2, X2 should race back toward his defensive basket, waving his hands overhead to deflect the pass.

goes this one better by occasionally playing a "sleeper" under the basket. It's surprising how many baskets this team has made in the last three years on passes the full length of the court. A bit of clever faking by the forward out in front helps. (Diag. 1).

### All-court defense

If the scoring team is trailing they are apt to desert the usual strategy of falling back into defensive territory to set up an organized defense. Since the ball has been put into play from the end-line, it now becomes more natural to defend immediately; the defense cannot afford to wait ten seconds for the ball to come across the center line, they will have to go after it right away. This is basketball in its most spectacular phase.

Sam Barry has found the all-court man-to-man a definite defensive stratagem at any stage of the game. After playing a waiting defense for ten minutes, his team very often will suddenly come out after the ball even under their offensive basket. This maneuver makes the going still tougher for the team scored upon; for the back men can no longer bounce the ball leisurely up to the center line before facing the necessity of doing something. Coaches will have to develop a set of back-court plays to beat a rushing defense. The offensive team may be forced to set up screens in their own back-court.

In general, basketball will again be played all over the court instead of in half of it. This should make for a more interesting game. **Diag. 2.** outlines a simple maneuver that Stanford em-



played after a basket when they found U. S. C.'s rushing tactics somewhat annoying.

### Fast break is usual method

These are more or less unusual types of offensive tactics by the team scored-upon. The usual method of advancing the ball will be the fast break by a quick pass down the side to a front man. No set play is necessary here: if three men can get the ball into offensive territory fast enough to catch the opponents short-handed, any kind of ball-handling should result in a good shot.

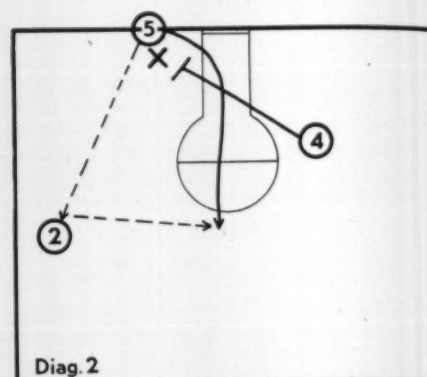
If you lean toward the spectacular you might be interested in what Charley Hyatt concocted as a member of the Universal Pictures team during the first season of the center jump's elimination on the Coast. The fans were delighted with his idea of four-men interference for the ball-carrier. In **Diags. 3 and 4** Hyatt played the role of left halfback. Spectators "go" for such type of plays and the one in **Diag. 5** in which a man is shaken into the clear by a screen in the back court.

By clocking the actual playing time of several Pacific Coast games, we found that the new method of putting the ball into play adds from seven to ten minutes more playing time, simply by removing the referee's tedious walk from the goal to the center circle. When you add to this the frequent immediate challenge presented by the defense after a basket instead of the usual adjustment of alignments when the ball is thrown up at center, five to ten minutes more are added to what the writer would call "challenging" play; that is, the type of play in which offense or defense is doing something more than just getting set.

Condition will play a greater part in determining the final score than ever before. The extra playing time plus the acceleration in tempo will place an additional burden on the wind. The lucky coach with a wealth of reserves may divide his squad into two separate units, substituting during a game in approved hockey fashion—a full team at a time.

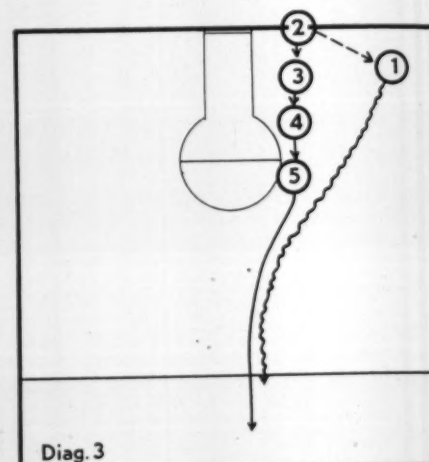
### Back-To-Ball Defense

Occasionally a defensive player will find himself in a position where he is forced to turn his back to the ball in order to hang on to the man he is guarding. There is a definite defensive pattern to follow in such a situation. In the accompanying pictures the ball-handler has just finished dribbling to his right and is evidently attempting a give-and-go. He pushes a one-handed bounce pass to a teammate (not in the picture) and shoves off to the left. His opponent has been playing him cautiously and is not fooled by the change of direction, even though he is forced to turn his back to the ball. By throwing up his right arm and extending the left arm, the defensive man makes a return pass to the offensive player difficult. The right arm is in an excellent position to deflect a lob pass while the left arm will stand in the way of a direct pass thrown on a line.



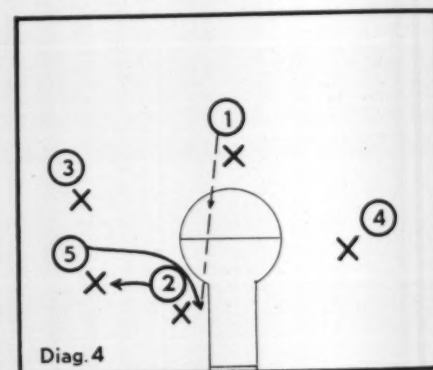
Diag. 2

This deep-court screen will pay dividends against a defensive man who presses too closely under his own basket.



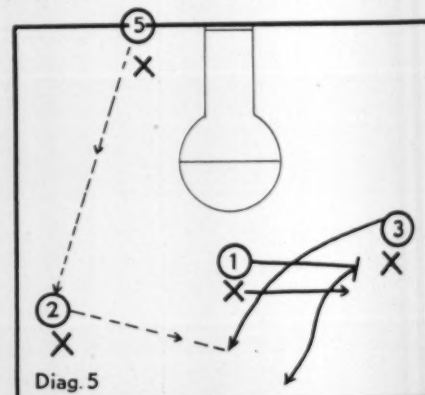
Diag. 3

After the pass-out, 1 dribbles behind formidable four-man interference (Indian style) as far down court as he can.



Diag. 4

As the dribbler and his bodyguards cross the center line, they spread and work a quick play before the defense sets too strongly.



Diag. 5

A long pass out, an unexpected screen on the side and 3 shakes loose for a pass close to the center of the court.



## THE FIGURE 8

By William R. Wood

William R. Wood, basketball coach at the University High School of the State University of Iowa, conducts the "Coaches' Corner" column for Scholastic Coach. In various parts of the country, systems similar to the "Figure 8" he describes in this article are identified by such names as "The Cartwheel," "The Spinning Wheel," "The Merry-Go-Round," etc.

**F**UNDAMENTALLY, there are only two types of offense; the passer either cuts inside of the receiver or he goes around him on the outside. Let us ignore the type of player who passes and then stands still. To consider all offenses as either fast breaks or slow breaks is merely to obscure more fundamental differences. Since speed is a very relative factor, some so-called fast breaks are really quite slow.

The offense that follows is a simplification of the famous "Figure 8" offense employed with such excellent results by Dr. H. C. Carlson's University of Pittsburgh teams. It offers a simple continuity for high school players in which the basic features of the "going-behind-the-receiver" and the "going-in-front-of-the-receiver" patterns are worked together. While speed and footwork are essential, the stress here is placed upon sure ball-handling and the correct timing of breaks.

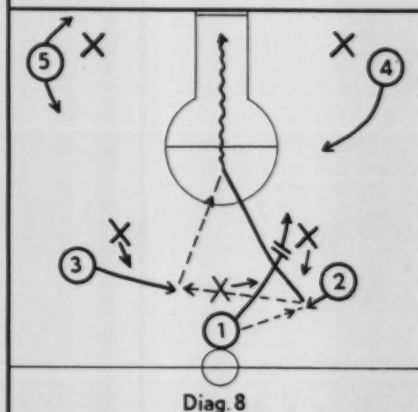
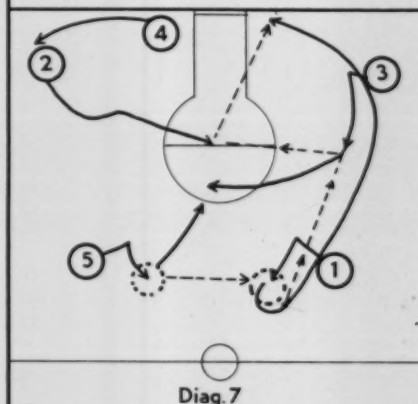
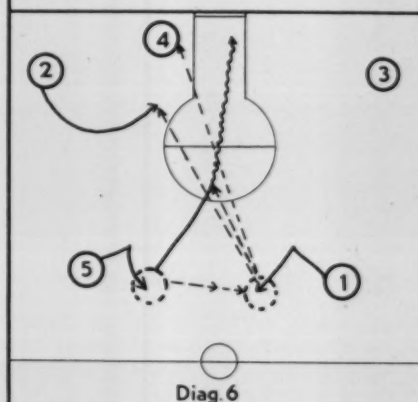
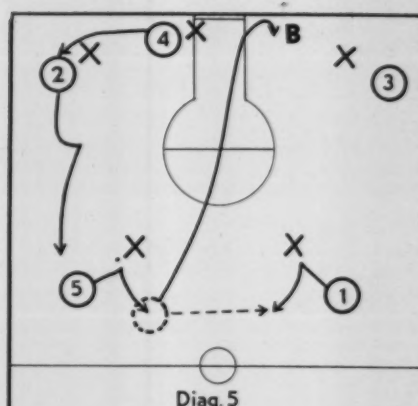
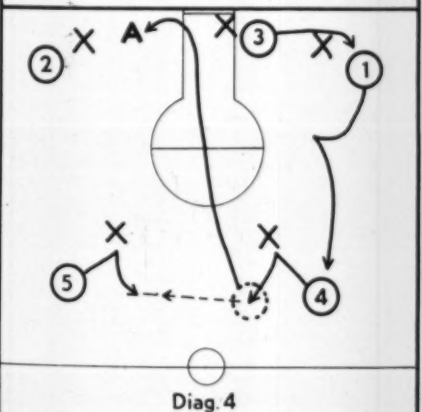
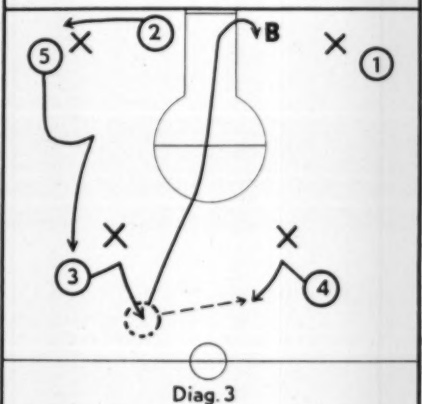
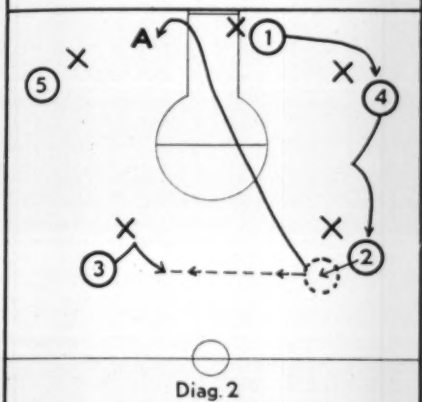
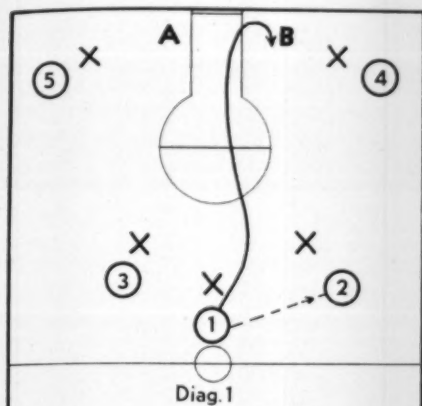
In the diagrams the numbered circles represent fixed positions from which the players operate. While the players move these positions remain constant. The path of the ball is shown by the broken line; the path of the player by the solid line.

With the offensive team in a 3-2 formation (**Diag. 1**) 1 passes to 2 and breaks around his guard into position B, watching over his shoulder for a possible pass all the way in. If he is open, 2 has the option of returning the pass to him for a fast dribble and lay-in shot, or of keeping the continuity going by passing to 3, who, after 1 has gone in, fakes a cut for the basket and comes back towards 1's original position for the pass, as shown in **Diag. 2**.

After passing to 3, 2 breaks for the basket and position A. As soon as he enters the free-throw circle, 4 starts a quick swing-in fake toward the basket and then comes out to position 2. At the same time 1 shuffles along the end line to position 4, watching the ball constantly in order to be ready for a follow-up in case the ball is passed in.

In **Diag. 3** the "merry-go-round" is kept in motion by 3 passing to 4 and breaking for the basket and position B. For the first time 5 springs into action by faking a swing-in to the basket and then pulling out to position 3 to wait for the pass from 4. 5 has taken the pass in **Diag. 4** and 4 is on his way

(Concluded on page 25)





# THE UNIFIED ALL-COURT OFFENSE

By E. R. Purdy

Presenting a series of closely interwoven plays that can function from any part of the court.

E. R. Purdy's basketball team at Rutland, Vt., High School attacks from a unique system of offense based on several series of closely integrated plays that are applicable in all the more common game situations.

**W**ITH the elimination of the center jump this year an acute need may develop for a more rounded and systemized offense; one that can develop from any position of the court, particularly after rebounds and opponents' scores. The swift changes from offense to defense may give the tight all-court man-to-man defense a new lease in life; and the offense must be prepared beforehand for such an emergency.

The solution lies in the adaptation of a few fundamentally strong set plays that are all closely related and woven into a plan of attack that will function from any part of the court, and against any type of defense. This is a large order but it can be filled. While no system can be so conceived as to anticipate every possible situation, the pattern of play can create uniform playing habits that will enable the players to work in unison in most emergencies.

To the coach who has already overburdened his team with too many plays it is obvious that the addition of more plays to the repertoire is a step in the wrong direction. What is needed is simplification, not elaboration.

The accompanying series of closely interwoven plays may be called a "system" as they meet the specifications of a complete pattern of play. Each series is composed of four plays which are fundamentally the same but with variations in order that the basic play may be worked from a fast break, slow break, and out-of-bounds and jump ball set-ups.

The first series of plays is based on the old "bucket" play, with three men in and two men out. The center stations himself on either side of the free-throw lane on the side opposite the guard who is handling the ball. His main purpose in life is to serve as a blocking post for either forward cutting or dribbling in for a shot, and then rebounding. But the center is close enough to the basket to be a real scoring threat.

## Set-up on slow break

On a slow break set-up the forwards go deep into the corners and time their

breaks simultaneously to a point opposite the foul line. One forward meets the pass thrown by a guard and the play develops accordingly. In handling the ball in the back-court the guard in possession should keep as close as possible to the center of the court so that he can pass at any time to either of the forwards or the center. The two-handed shoulder high bounce pass is recommended for feeding.

Note that on all plays the ball and the players move diagonally across the court. The receiver of a pass always cuts in front of his guard and behind the man he passes to. By always meeting the ball, the receiver minimizes the chances of interception.

In **Diag. 1**, 1 whips a pass to 3, who moves up for the ball. 4 moves out of the corner slowly, waits until 3 gathers in the pass and then cuts sharply in front and around 5, running X4 into the post. 3 shoots a pass to 4 and the latter dribbles in for a shot. If X5 switches to cover 4 after the screen, 4 hook passes to 5 who swings back toward the basket for a pass or rebound after screening X4. If 1 cannot or does not pass to 3, 2 should be alert and cut in to help out 1.

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**The four series of plays on the opposite page follow a horizontal sequence. Although all of the plays were diagrammed as they develop on the left side, they work equally as well from the right. The players numbered 1 and 2 are usually the guards, 3 and 4 are forwards and 5 is the center.**

---

The foregoing is a description of the play as it develops from a slow break, but the pattern remains consistent in the other situations diagrammed in the series.

For example, in the fast break play outlined in **Diag. 2** although the play develops under the opposite basket the passing is almost the same as in **Diag. 1**. 1 recovers the rebound off the defensive basket, shoots a short pass over to 3 coming in, who, in turn, whips the ball to 4. The latter dribbles rapidly down the court until stopped by a defensive man. If 5 is open, 4 can give him a scoring pass.

Options are more numerous on fast break plays since one man cannot always be depended upon to break into the open. Suppose 4 had been forced to do the rebounding. Most likely, instead of passing to 4 after receiving the pass-out from 1, 3 would have passed directly to 5.

In **Diag. 6**, for instance, suppose the job of rebounding would have fallen to 5. Then he, instead of 1, would pass to 3, and the final pass of the play

might go to 1 who switches assignments with 5.

In the held ball play at center (**Diag. 3**), the tap can go to either 1 or 3. On an out-of-bounds ball from the side-line, **Diag. 4**, 3 can take 4's place as the man who cuts around 5 for the pass.

## Variations

In Series 2 (**Diags. 5, 6, 7 and 8**) the plays are essentially the same as in Series 1 up to the point where 4 cuts in front of the post. Let us assume that 4 has over-run his mark or perhaps the path to the basket has been blocked. Instead of attempting to force his way through, he continues his dribble across the free-throw lane, pivots and sets up a play for 3 or either of the guards, 1 or 2, cutting down the center. This pivot can be set up anywhere outside the 3-second zone.

The third set of plays, or rather a further variation of the one fundamental play, simply injects the feeding guard, 1, more prominently into the picture. After passing to 3, 1 cuts around him for a "hand-out" pass or for an indirect pass from 4. 1 may be driven into the corner by fast switching X3 after the "hand-out" pass, a switch that can be prevented if the ball is passed first to 4 before returning it to 1. This latter option should be used sparingly, especially on a held ball where possession is uncertain. Note the cleverly disguised double screen in **Diag. 12**. First, 5 screens X4 while 4 cuts around for the pass from 3, out of bounds. 3 takes one or two steps in from the side-line and pulls up short. 1 delays momentarily and breaks outside 3 for the pass from 4, at the same time bumping his guard into 3.

## Direct pass possibilities

The fourth and last group of plays, Series 4, illustrates the possibilities when 1 elects to pass directly to 5, the center. The latter should be careful to keep outside the circle or lane and come forward to meet the pass. 5 can pass to 3 cutting directly for the basket; to 4 following his usual route; to 2 breaking down the weak side; or, as a last resort, can pivot and dribble in for a lay-up shot or shoot directly off the pivot. This set of plays should be used mainly as a threat to keep the offense guessing or when 3 is so closely covered that 1 cannot get the first pass to him.

While these plays are illustrated as they develop from the left side of the court, they work just as effectively on the right; in fact, when the plays are worked from the right the final step-shot with the right hand is much easier for most players.

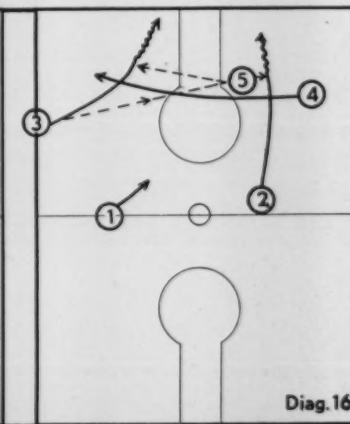
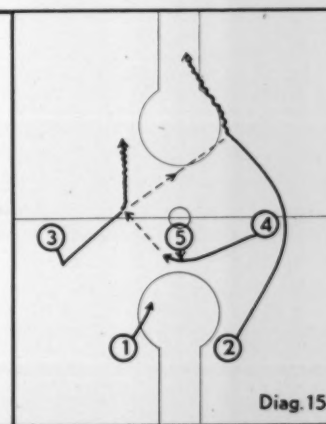
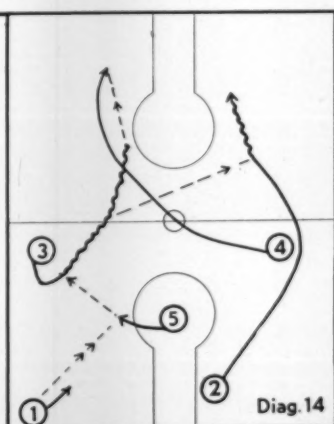
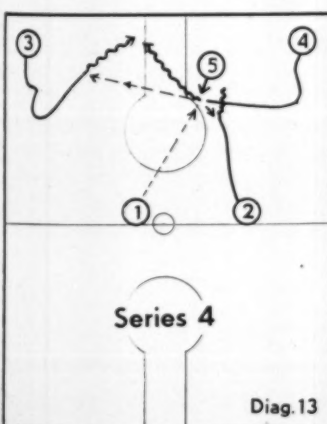
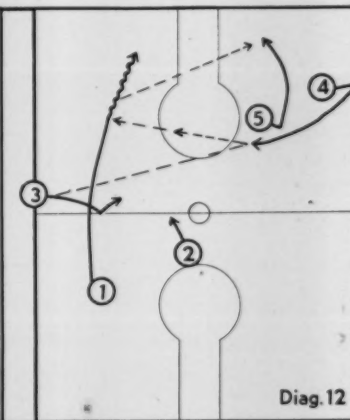
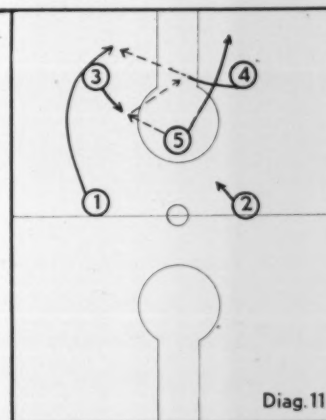
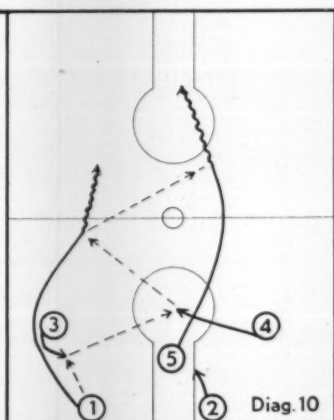
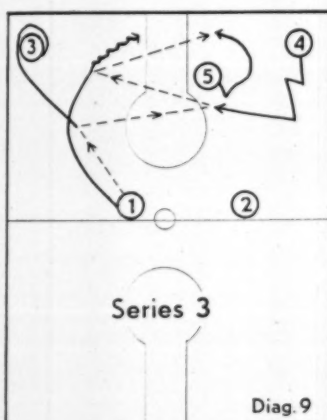
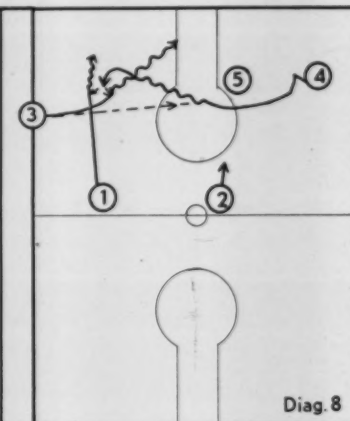
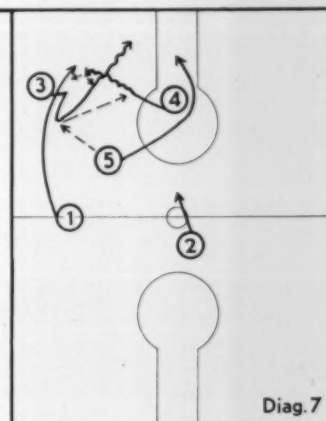
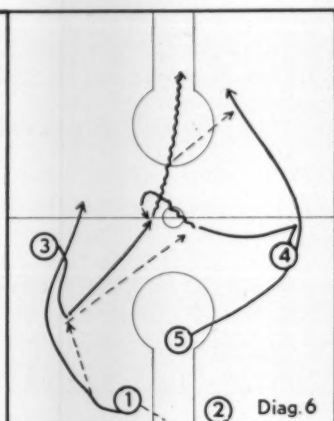
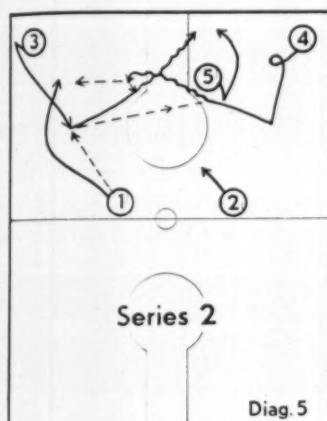
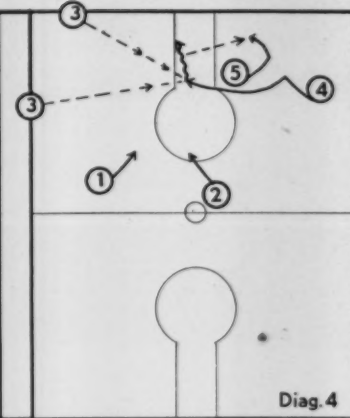
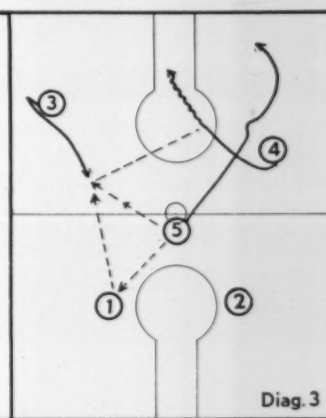
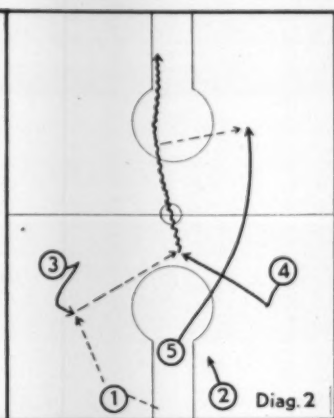
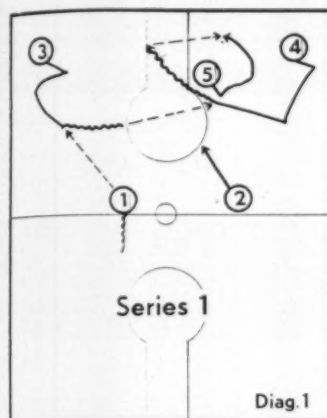
# PLAYS FOR ALL-COURT OFFENSE

## DELAYED OFFENSE

## FAST BREAK

## HELD BALL

## OUT-OF-BOUNDS





# Defensive Footwork

## Left: Cross-over Step

IN THIS series of pictures a defensive player guarding a wide-awake opponent pays the price for his faulty foot action. The offensive player is aware of this defect in his guard's armor and plans his play accordingly. Starting from the left sideline, the offensive man starts out toward the center at half speed, watching his guard closely out of the corner of his eye.

Note how carefully he times his change of direction in the second, third, fourth and fifth pictures. As the guard cross-steps, his opponent smartly counters with a cross-step of his own—past the guard and in toward the basket. The defensive player is left flat-footed with little or no chance of recovery in time to head off his man.

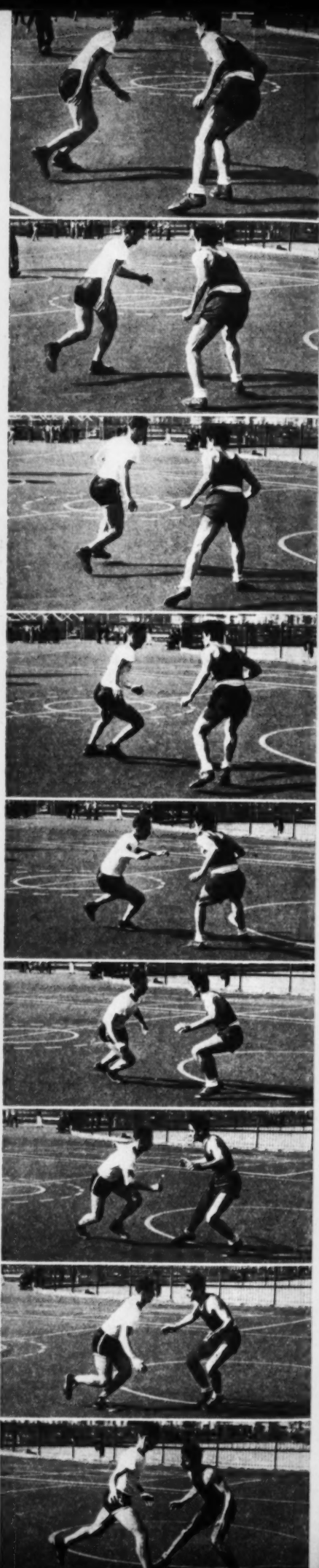
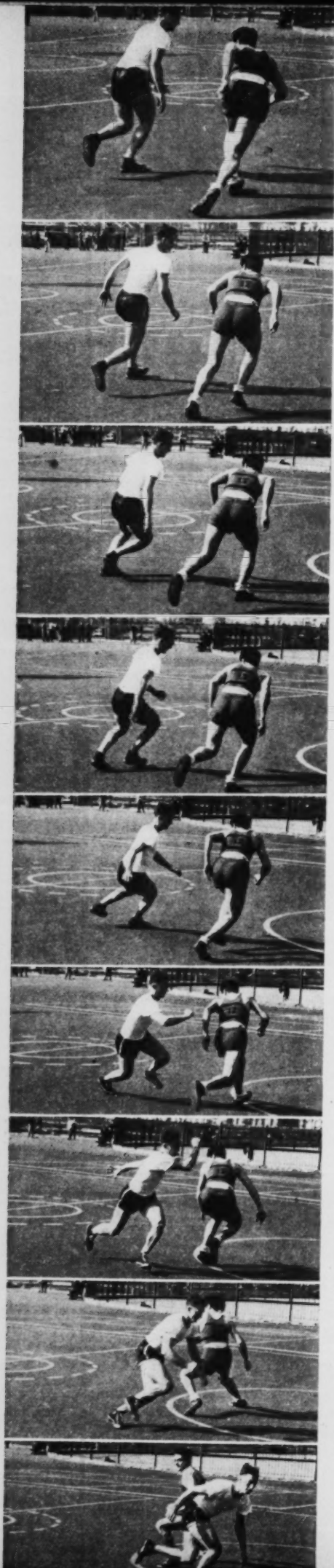
Up to the time the offensive player definitely commits himself as to the direction of his break, the guard should employ the boxing step rather than the cross-over.

## Right: Boxing Step

WHEN the guard switches to the boxing step or glide, he is much harder to fool by shifts or changes of direction. Again the offensive player attempts to lure him from the sideline to the center with the idea of "pulling a change," but this time it is no go.

The guard has turned his body around so that he now faces the offensive player squarely. As the latter goes left, the guard shuffles (rather than cross-steps) with him. With short, hopping strides he keeps abreast of his man. In the sixth picture the offensive player is about to cross-step and go through. The guard merely pulls his left leg back, and continues with his boxing step. In the next picture he has actually picked up a full stride on his opponent.

The defensive man can employ the boxing step only up to a certain point. When longer distances are involved he may have to resort to the running stride.





# PLAY OF THE OFFENSIVE GUARDS

By Donald L. Tryhall

Suggestions on how to work the ball through a pressing, aggressive defense.

Donald L. Tryhall, coach at North Division High School in Milwaukee, Wis., prepares his back line of ball-handlers for emergencies where the defense is so tightly drawn that it is difficult to work the ball in to the front line. Advancing the ball is a specialized art to Tryhall, and he trains his guards to do the job.

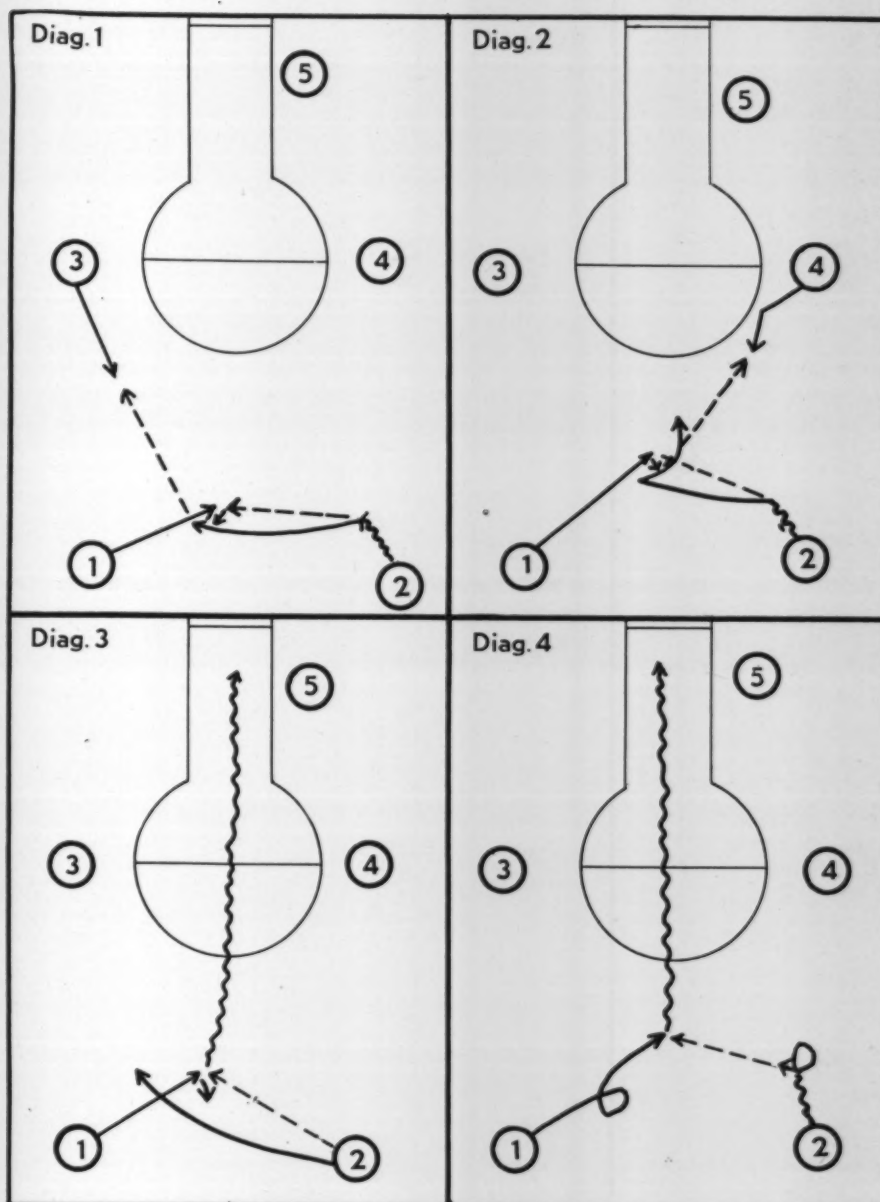
**A**N AGGRESSIVE defense often can disrupt the entire system of attack by throttling the play of the ball-advancers. Against such a defense the feeders (back men) need something other than straight passes to shake off the defense and keep them guessing. Otherwise the defensive team may come up on the ball-handlers and hinder their passing and pass-receiving. On a small court the defense can very often tie up the ball if the defense is not sufficiently varied.

Occasionally the defense may drop back and give the back men of the offense plenty of room. They make it difficult for the back men to get a pass through safely to the front men and any attempt by the back men to pass and break to the basket is wasted effort, as the defensive pick-up is too simple. In this situation the ball-handlers should take their shots. If they start making them (and they should with all the time they have) the defense will think twice about falling back too far.

But suppose the defense is aggressive and hard to fool by feints and changes of direction, what then? The accompanying diagrams show several maneuvers that can be used to work the ball through to the front men. First, note the somewhat unusual set-up. From his position under the basket, the pivot man (5) can be used as a post, rebounder or as a target for a pass from 3 or 4.

If either the back or the front men elect to cut or dribble down the center, 5 opens the floor for them by drawing his man into the corner. He can play around the corner and take passes from his teammates and feed them back in again, or he can drive up to the foul line for a temporary pivot play. 3 and 4 can run directly into their positions or go into the corner and circle out.

In **Diag. 1**, X1 and X2 have drawn a tight net around 1 and 2. 1 suddenly drives down the middle of the floor as far into offensive territory as X1 will permit. He pivots, takes a pass from 2 (either direct or bounce) and gives it right back to him as 2 follows his pass. 2 immediately shoots it over to



3 on the left side of the floor. **Diag. 2** shows how the play develops from the other side of the floor.

1 and 2 have many options on the play. After receiving the return pass, 2 can continue his break and dribble in to the basket. Or he may stop short and cut back around the left side of 1 (who is standing with back to the basket). 1 can fake the pass to 2, pivot and dribble in himself (**Diag. 3**). When a back man has shaken loose and is breaking down the center, the three men down the court should fade toward the side-line to prevent a switch by their guards. If their man does leave them to cover the free teammate, then the front man should cut for the basket and the situation becomes 2-on-1. 1 may also fake a pass to 2, slip 3 or 4 the ball and swing around for a

return pass deep in the front court.

In **Diag. 4** an over-ambitious guard, X1, attempts to outsmart the offense by playing the ball instead of the man. He winds up a sadder but wiser man. Dribbling down the side-line, 2 is cut off by his guard. 1 starts driving down the center at a tangent as he has done before, and X1 expects the same type of play. He overplays his hand by edging over more to the center. 1 smartly changes direction, cuts behind X1 and receives a lob pass from 2.

The two offensive back men should know each other's style of play thoroughly so that by a simple word or gesture they can tip off each other as to what they are planning next. A good pair of feeders in the back court loosens the defense and makes the offense click.

# From the States

This department includes correspondence from state high school coaches' associations and state high school athletic associations. All associations are invited to participate.

## Illinois

### Practice teachers can coach

A NEWLY adopted amendment to the by-laws of the Athletic Assn. will now permit students who are taking courses in education in a college or university to do practice teaching in a high school coaching department. The general rule states that only certified teachers are eligible to coach interscholastic athletic teams, but the amendment will enable high schools in the vicinity of a college or university to press practice teachers into service. The new rule is adopted for a trial period of two years.

Another amendment gives the state association authority to penalize a student for gross unsportsmanlike conduct. The new rule reads, "Any student in any school belonging to this association may be barred from participating in athletic contests for violation of the by-laws, or for gross violation of the ethics of competition or the principles of good sportsmanship."

At the annual meeting of the Coaches' Assn., held in connection with the Illinois high school conference, the following officers were elected for the new year: W. K. MacWherter, Arcola, president; Ken Elliott, LaFayette, vice-president; and Paul J. Houghton, Marion, secretary-treasurer. The program for the coaches included clinics in swimming and wrestling, and a showing of the sound picture, "Basketball."

The new molded type basketball has now been in use long enough to indicate a possibility that it may ultimately replace the sewed type ball. The molded balls are more durable and accurate. One state, Alabama, has already adopted the molded type ball for the state final tournaments. The Illinois association has approved the ball for use in any state sponsored tournament and are favorably inclined toward its use in the state finals. During the early part of the season some difficulty was experienced in obtaining these balls but a sufficient number is now available.

### Smaller high school discus

An investigation relative to the comparative sizes and strengths of hands of high school and college competitors in the weight events is being made. If the present adult sized discus is correct, then the size that would fit the high school needs, correspondingly, would be somewhat smaller in diameter and considerably less in weight. Such a discus is being produced for experimental purposes. It is probable

that the special high school discus will be used in many meets during 1938.

Much of the experimental work has been done in the track department at the University of Iowa under the joint sponsorship of the Iowa track coaches and E. A. Thomas, National Federation representative on the track and field rules committee. Further experimental work is being done in connection with the low hurdles to determine whether the present 18 yards spacing is correct.

### From other ports

At the last meeting of the New Mexico H. S. Athletic Assn. a committee was appointed to consider the matter of full adoption of the interscholastic football rules. At the beginning of the current season the association adopted the major provisions of the rules and these appear to have been popular. A similar committee is functioning in the state of Washington.

The Ohio H. S. Athletic Assn. has adopted an effective method to insure adherence to the state rule that requires all football and basketball officials to be registered with the state association before they are eligible to work high school games. If any school uses an official who is not registered, the school is reprimanded and in addition is fined an amount equal to the registration fee for officials.

The National Interscholastic Football Rules Committee will meet in Chicago on Jan. 7 and 8 to act on the 1938 code. Each of the 19 state associations playing under the National Federation rules is represented by one voting delegate. E. R. Stevens, president of the Federation, is chairman of the committee.

H. V. PORTER,  
Illinois H. S. Athletic Assn.,  
Chicago, Ill.

## Kentucky

### Early season basketball

WHILE Male, Manual and Covington have been fighting it out for state championship honors on the gridiron, many of the schools have already turned to basketball. Midway High's early season games are being followed with unusual interest. With three of last year's state champions still in the line-up, Coach Burns' quintet will be hard to beat. In Armon Porttwood and Charles Murphy, Midway boasts of two of the state's outstanding players.

Little Inez, located in the hills of Martin County, lost all five of the sensational players that carried the school's banners into the state semifinals or finals during the past three years. Coach Williamson developed one of Kentucky's cleverest teams despite the fact that the school has no access to an indoor playing court.

The Board of Control is making every effort to stimulate interest in track and field sports. A committee of three was recently appointed to formulate a system of district elimination meets to send first and second place winners to the state finals at Lexington. In the past it has been possible for a school to enter as many boys in the finals as they desired, regardless of previous performances. The members of the committee follow: A. D. Allen, Holmes High School of Covington; Coach Shively of the University of Kentucky; and Jack Dawson of Fern Creek.

WILLIAM J. "BLUE" FOSTER,  
Kentucky H. S. Coaches Assn.,  
Newport, Ky.

## Connecticut

### Spencer in new post

THE Interscholastic Athletic Conference has created the position of executive secretary and appointed Walter B. Spencer to the post. Mr. Spencer, principal of Commercial High School in New Haven, was president of the Conference for the past sixteen years. Harold A. Swaffield succeeds Spencer to the presidency. Swaffield has been an officer in the Conference for many years and at present is secretary of the National Athletic Scholarship Society.

Establishing an executive secretary should result in further improvement of the Conference program for high school boys and girls, and will also lead to a wider participation and distribution of the work of the Executive Committee than has heretofore been possible.

### Molded basketball approved

At a recent meeting of the Executive Committee the new molded basketball was approved for use in the final tournament games next March. The set-up for the big tournament will be modeled very closely after the one used in 1937, which proved to be the most successful series of games ever run off in the state.

The preliminary eliminations will be open to all, though the experience of last year will undoubtedly cause some teams to weigh their chances more carefully than ever. The New Haven Arena will again be the scene of the final games on March 9, 11 and 12.

The Athletes' Accident Fund of the New England Council seems to be firmly established and operating smoothly. The Council will pay all claims. Close to 700 boys were covered in football.

## Idaho

### Transfer rule

TWO amendments which were presented at the delegate assembly last month are being voted on through the mails. One amendment would make a student ineligible for athletics





**GUARDING THE FOUL SHOOTER:** The usual method. The defensive man faces the shooter from the point where the circle meets one of the parallel lines. After the shot, the guard leaps in front of the opponent so that he faces the basket with his back to the shooter. This makes a back tap to the shooter impossible and prevents a follow-up. However, an alert shooter can sneak around the defensive man.

upon his 20th birthday. The other amendment would modify the present transfer rule, in that, if a student's parents moved from his home district during the last grading period, the student could complete the semester in the first school and be eligible in the second school when he enrolled at the beginning of the next semester. At present the student must transfer with his parents or lose a semester of competition.

### Football round-up

In football Bonners Ferry won top honors in the Panhandle district despite a last game defeat by Sandpoint. In District 2 Lewiston held a slight edge over Moscow for the season's play, losing only to Walla Walla, Washington, 6 to 0. Emmett was tops in the Snake River Conference in District 3. Fruitland copped Class B laurels. Gooding won the Class A championship and Glenns Ferry the Class B title in District 4.

Malad went through the season without a defeat to share District B honors with Montpelier, who won nine games without a loss. In District 6, Sugar City and Shelley compiled the best season's records.

The Big Ten Conference, composed of the larger schools in southern Idaho, was led by Boise, followed by Burley and Idaho Falls.

E. F. GRIDER,  
Idaho H. S. Intersch. Act. Assn.,  
Boise, Idaho.

### Missouri

#### Basketball clinic

**B**ASKETBALL men are looking forward to the Coaches Assn.'s annual basketball clinic in Columbia on Saturday, Dec. 11. The program this year has been prepared under the direction of George Edwards, coach of Missouri University.

A lecture by Bill Smith, coach of the state champion Maryville High School team, will open the program at 10 A. M., to be followed by a showing of the Converse Rubber Co.'s fine film, "Basketball," which features some of the country's outstanding coaches and players.

In the afternoon the coaches will convene for their annual business meeting and election of officers. The remainder of the afternoon will be devoted to a practical demonstration by Edwards and a rules interpretation meeting led by Jack Matthews of the University. The entire group will be guests of the University in the evening at a basketball game with St. Louis University.

The Rolla District Coaches' Assn. held their annual meeting during the District Teachers' Meeting and elected John Mason of Sullivan, president, and Oral Spurgeon of Bland, secretary-treasurer. A splendid panel discussion of physical education problems was

(Continued on page 31)



**SUGGESTED DEFENSE:** This time the defensive man jumps in front of the shooter so that one side is facing the basket and the other, the shooter. There is no loop-hole in this method of defense. It is still impossible for the shooter to receive a back tap or drive in for a rebound, but now he cannot sneak around the defensive player. Split vision enables the latter to cut off this avenue of ingress.

# The Philosophy of Athletics

By E. B. Stansbury

This article appeared originally in the *Kentucky Education Journal* and is reprinted herein by permission of the author, E. B. Stansbury, physical education instructor at Western Kentucky Teachers College, Bowling Green, Ky.

**I**F WE are to assume what the title of this article indicates, we must first agree on what is athletics, and second on what position it should take in the curriculum. Athletics, strictly speaking, is any form of physical activity which is highly specialized by player, director (coach), spectator, and equipment.<sup>1</sup> Wherever athletics is being conducted, there is learning of some nature through the physical.<sup>2</sup> One of the academic definitions of learning is that it is a change of conduct due to experiences.<sup>3</sup> The theory of the unity of learning is whenever physical adjustment is being made, there is likewise a correspondingly mental adjustment manifested. In placing athletics in the secondary school curriculum, we have no choice in where it is to be classified. It is *Physical Education*.<sup>4</sup>

The question is immediately asked, what is physical education? Physical education is that phase of the whole educational process which is concerned with all big muscle activities and their related responses, and with the presentation of opportunities which the individual may have to make adjustments physically, mentally, morally, and socially with the least amount of resistance. General education, according to academic definitions, is that process of change or modification of the individual which will enable him more nearly to reach his maximum possible development in all phases of life, and to make his finest possible adjustment to the world in which he lives.

Individuals who have had at heart for years the destiny of athletics in the secondary schools have realized that in order for activities of this nature to be placed in the curriculum and to be kept there, certain educational principles must be observed: first, the elimination of certain devastating influences handed down from the colleges to the secondary schools; and second, the elimination of the influence upon athletics of persons interested for selfish and personal reasons, of erratic alumni, and of

other forces outside of school. The schools have had certain domestic problems to iron out, such as the problems of low scholastic requirements, idolizing of star athletes, exploitation of youth, gate receipts, "big-time" schedule, lack of academic professional preparation of leaders, lack of correct spirit of winning, professionalism, and mendacity.<sup>5</sup>

## Trained in field

For the past twenty-five years much has been done by the school administrators and those otherwise deeply interested in order that these existing situations might be relieved. They are eager to require the indi-



viduals who are responsible for the physical education program to be trained in that particular field, regardless of the fact that they were or were not star athletes. The prospective instructor should have certain prescribed courses in education and a minimum number of hours in technical, cultural, and activity courses for graduation; this has not always been the case.<sup>6</sup> Even now and possibly for many seasons to come, and so long as schools place the emphasis on winning and losing, as is the case now in some instances, what can one expect of a coach, even though he knows that the emphasis is in the world place?

This problem of where to place the emphasis must be solved by the administrators. Then too, how can the educators expect to instill into

the minds of the scholastic athlete the social moral traits, and the civic and individual qualities which are necessary for good citizenship, when over-enthusiastic alumni and friends tear down the opponents' goal posts, carry off hotel towels, give expensive awards, etc., as tokens of victory, as well as to run officials out of town when the home team loses? This sort of thing is as old as time itself. The Greeks tore down their houses and walls around the cities to celebrate the hometrodding Olympic winners. At the same time they put to shame the losers.

So long as the aforementioned conditions exist, how can one expect a sixteen-year-old boy to be modest in victory and emotionally balanced in defeat? In almost every instance, the thinking school people know it is wrong, but they are not sure that they have the proper support to act against such policies.

## Play values

If we furnish the correct situation, we have no fear of non-participation by the student, because it is a natural tendency for girls and boys to play.<sup>7</sup> But these instinctive activity patterns are very meagerly manifested if the student is not given the correct leadership, and adequate facilities and opportunities to meet situations at play which in later life will cause him unconsciously to re-thrash these related patterns. Play, especially the competitive type, provides an opportunity to teach the individual habits of attitude under the head of self-initiative, alertness, ingenuity, self-reliance, self-control, will power, courage, etc.<sup>8</sup> We must continue to keep in mind the objectives and principles of physical education at the secondary school level if we are to realize the full values of athletics and its true adjustments. As leaders we are interested in the development of organic vigor, of neuro-muscular skills, or correct attitudes toward play, and of certain social-moral traits.<sup>9</sup>

The child of junior high school age possesses the following psychological traits: high loyalty to groups, a desire to affiliate with groups, abstract reasoning, increased power of

<sup>1</sup> Williams, J. F. and Hughes, W. L., *Athletics in Education*, pp. 52-67.

<sup>2</sup> *Ibid.*

<sup>3</sup> Harmon, J. M., "Play vs. Work in the Gymnasium," *Journal of Health and Physical Education*, January, 1937.

<sup>4</sup> Williams and Hughes, *op. cit.*, pp. 52-67.

<sup>5</sup> Griffith, Coleman R., *The Psychology of Coaching*, pp. 1-18.

<sup>6</sup> Nixon, E. W. and Cozen, F. W., *An Introduction to Physical Education*, pp. 213-222.

<sup>7</sup> Pillsbury, W. P., *Education as the Psychologists See It*, pp. 72-76.

<sup>8</sup> Mitchell, Elmer D., and Mason, B. S., *Theory of Play*, pp. 243-290.

<sup>9</sup> Hetherington, Clark, *School Program in Physical Education*, pp. 21-45.

(Concluded on page 26)



**ANDY KERR**  
of Colgate

**A. A. STAGG**  
of College  
of Pacific

**And Now**  
**MATT MANN**  
of Michigan

## GIVES YOU A NEW POSTER

### ● Why the Poster is Important

The poster on the following two pages—the third of a series—carries a message of vital importance to every high school coach and to every boy and girl who wants to excel in sports. This new poster—written by Matt Mann, the famous Michigan swimming coach—tells why athletes can “be ready for the gun with perfect condition” only by abstaining from alcoholic beverages. This poster deserves a prominent place on YOUR bulletin board, where it will inspire students to keep their bodies in top condition and where it will help you drive home the most important training rule any coach ever gave to a team.

### ● How to Use the Poster

This poster, strikingly printed in two colors, appears on the next two pages. We have placed it here so that you can be certain to have a copy. Remember, as an athletic director and coach, you have a greater opportunity to influence the development of the students in your school than most other members of the faculty. This poster offers you a chance to make that influence more effective than ever before.

The poster can be easily removed without in any way damaging your copy of *Scholastic Coach*. With a knife, or letter opener, just fold back the two staples in the center of the spread and lift out the poster. Then mount it on your bulletin board, where its message can be read not only by the members of athletic squads but also by all other students in your school.

If you wish additional posters, we will gladly send you any number up to five from the limited supply we now have. If for some special reason you desire a larger quantity we will endeavor to fill your order. Write direct to this office or use the Mastercoupon on the last page of this magazine.

26,000 POSTERS IN THIS  
SERIES HAVE BEEN USED  
BY HIGH SCHOOLS AND  
COLLEGES THROUGH-  
OUT THE COUNTRY!

### *Andy Kerr says:*

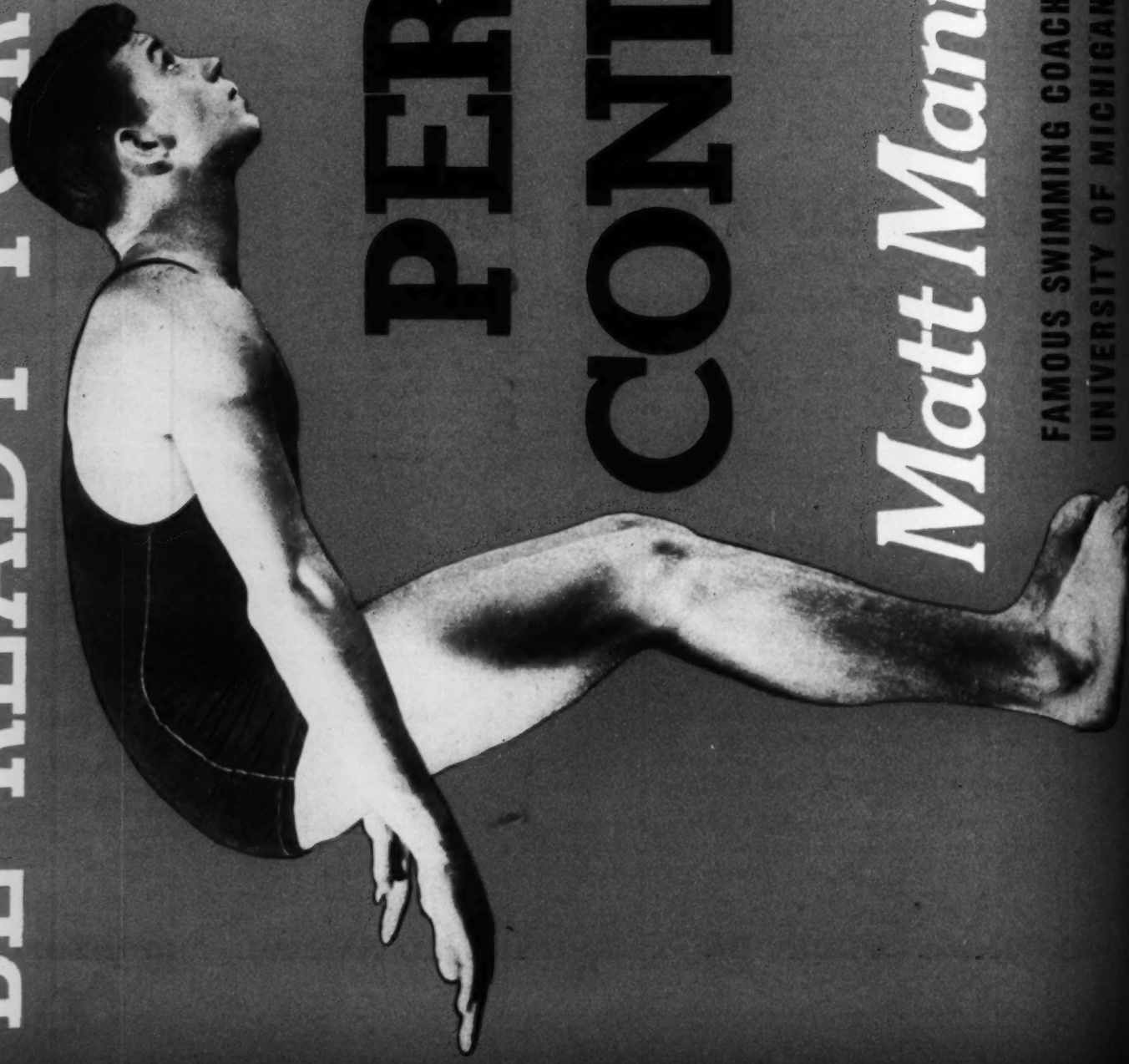
“One of our first training rules is never to drink alcohol in any form. I would rather have an athlete break almost every other rule laid down than to break this one concerning the use of intoxicants.”

### *A. A. Stagg says:*

“I honestly believe that the main reason why, at seventy-five years of age, I am able to coach football and to play tennis and run half a mile when I choose is that I have not impaired my bodily mechanism by drinking alcoholic beverages.”

**ALCOHOL EDUCATION, 1730 CHICAGO AVENUE, EVANSTON, ILL.**

BE READY FOR THE GUN



*with*

# PERFECT CONDITION

*Matt Mann*

FAMOUS SWIMMING COACH  
UNIVERSITY OF MICHIGAN





UNIVERSITY OF MICHIGAN



# "SHUCKS!"

said the forward,

## "I'M NO KID!"

THE STAR FORWARD was being sarcastic.

"So Coach says 'Don't drink coffee!'" he snorted, "Where does he get that kid stuff? I'm six feet tall and I weigh 180 pounds...how can coffee hurt *me*?"

Patiently his coach explained that coffee contains caffeine...a drug stimulant that can often cause indigestion, nervousness, loss of appetite and loss of sleep.

The forward grumbled something about "Can't enjoy a meal without a hot drink"...but the coach didn't press the point.

He simply saw to it that Postum was served to the squad after the next practice session.

"Hey," said the forward, "this is good! What is it?"

"It's Postum," the coach replied, "and it contains no caffeine. Yet it gives you the hot drink you need with your meals, and since you like it so much, why not try drinking it instead of coffee for a while?"

The forward poured himself another cup of Postum and sniffed its delightful, steaming aroma.

"By golly," he said, "I'll do it!"

Many a wise coach has found Postum useful in helping to break the coffee habit. You know that athletes in training should not drink coffee, so why not recommend Postum to the boys on your squads? They'll love it... its cheering warmth and rich, delicious flavor, full-bodied and satisfying, make boys forget all about forbidden beverages. Postum is simply whole wheat and bran, roasted and slightly sweetened. It contains no stimulant of any kind. A Product of General Foods.

**Free! Basketball Booklet!** We recently issued a new basketball booklet, "Attack in Basketball," written by Lon Jourdet, basketball coach at University of Pennsylvania. This handy sports manual is an authoritative discussion of the passing attack. It is illustrated with diagrams showing basic offensive plays, and will prove of unusual interest to the boys on your squads. We shall be glad to send you—free—as many copies as you need for your players. Also, as many trial packages of Postum as you need for your team and candidates. Just fill in and mail the coupon.

B. C. 12-37

GENERAL FOODS, Battle Creek, Mich.

Please send me.....sample tins of Postum. Also.....copies of "Attack in Basketball."

Name.....

Street.....

City.....State.....

Fill in completely—print name and address. If you live in Canada, address: General Foods, Ltd., Cobourg, Ont. (This offer expires July 1, 1938.)

# BASKET

[illegible]A circular, black and white portrait of a man with short, dark hair, wearing a dark suit jacket, a white shirt, and a dark tie. He is looking slightly to the right of the camera with a neutral expression. The background of the portrait is a light, textured gray.

"I have always advocated the use of the foot during athletic training periods. One becomes accustomed to the wholesome habit and will never be without it."—W. M. Scott, Trainer, Carnegie Institute of Technology.



## This image shows a full page of blank graph paper. The grid consists of small squares formed by thin black lines. On the left side, there is a vertical margin line, creating a narrow column. The rest of the page is filled with the main grid. There are no markings, text, or drawings on the paper.

[illegible]

"Postum  
table."—G  
University

# IGHT CHART

## t daily

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IN

OUT

### ULES

some food.

es of water every day.

ate regularly every day.



"Postum should find a place on every training table."—GEORGE E. KEOGAN, Basketball Coach, University of Notre Dame.

"Use Postum be using."—Univer



**POST THIS WEIGHT CHART  
ON YOUR TRAINING ROOM  
BULLETIN BOARD**

**IT IS EASILY REMOVED FROM THE MAGAZINE**



"Use of stimulants retards physical development. Postum makes a non-stimulating drink, which may be used safely by the athlete in or out of training."—TUCKER P. SMITH, Trainer, Ohio State University.



"I most heartily endorse the use of Postum for all athletes during their training periods, and am planning to use it exclusively in the future."—JOHN F. BOURKE, Trainer, Colgate University.





## IRON MEN AND HOW TO BUILD THEM



By *Glenn V. Warner*

FOOTBALL COACH  
TEMPLE UNIVERSITY

An "Iron Man" is a man who can "take it." Size and weight have very little to do with it. For the one big thing that makes an "Iron Man" is *physical fitness!*

Training for physical fitness isn't hard. Habit is the big thing. Occasional spurts of training do no good. You must *stick to it*. On this page I have outlined briefly the basic program I have used in training athletes. It's a simple program ... but it builds "Iron Men"!

**SLEEP...** Get plenty of sound sleep. Go to bed early ... and at the same time every night. If you are actively engaged in athletics, you'll need a little more than 8 hours of sleep.

**KEEP OUT OF DOORS...** Get plenty of fresh air and sunshine. Be out of doors every day, if only for ten minutes.

**YOUR EXERCISE...** Exercise properly and regularly. Do your setting-up exercises vigorously and earnestly until you feel a bit tired ... then quit. Don't over-do-it. Any of the regular setting-up exercises will do, but choose them so that

each part of your body gets the same amount of exercising as every other part.

**HOW TO EAT...** Eat at regular hours...and take your time. Chew your food thoroughly. Eat generously of the leafy vegetables. All fruits are excellent. Eat sparingly of rich desserts, pastry, candy, and highly seasoned and fried foods. Avoid spirituous drinks and soda waters containing artificial syrups. A warm drink with meals is desirable, but I try to discourage my football players from using coffee. It is inclined to interfere with sleep, and many coaches now forbid its use altogether.

**TEAR OUT THIS  
WEIGHT CHART  
AND POST IT ON  
YOUR BULLETIN BOARD**



*to all athletes and students*

**"The big purpose of athletics is to build better men, both morally and physically. Alcohol in any form can only tear down, so that there is absolutely no place in athletics for alcoholic poison."**

*Walt Mann*

## **ALCOHOL EDUCATION**

1730 Chicago Avenue

Evanston, Illinois



# A BLACKBOARD DRILL IN ALCOHOL EDUCATION

## *Alcohol and the Nervous System*

### **A Message To Coaches and Physical Education Directors**

*These blackboard drills are designed to give you scientific facts about alcohol and its effects on the human body to be used in discussions on training rules with your athletes and students.*

IN the last blackboard drill, we discussed alcohol and endurance in conjunction with the now famous Alonzo Stagg poster. Endurance has always been a prime requisite in athletics and in the game of life. An equally important necessity for good condition is a healthy nervous system and all that this term embodies. Alcohol is a narcotic and, as such, it is an agent that temporarily suppresses or lessens the activity of living matter. It actually has the same effect on nerve centers as such well-known narcotics as chloroform, ether, morphine, and others. The difference is that alcohol is the only drinkable narcotic, but its effect is the same, the degree dependent, of course, on the quantity consumed.

Alcohol upsets the nervous system for basically the same reason that it affects the endurance qualities of our bodies. Because alcohol is a solvent and a dehydrant, it readily absorbs and cuts down moisture in the body, as explained in the blackboard drill on endurance.

The cells composing the nervous system are insulated in a filmy fat-like substance called lipid. The brain, because of its high percentage and large amount of fatty substances, is easily disturbed by alcohol. This disturbance of the insulation material for body nerve cells and its ultimate effect may be likened to the defects in the insulation of wire used in our electric lights, radio, telephone, refrigerators, etc. Defective insulation results in a short circuit somewhere down the line. Defective insulation of nerve cells also means a short circuit in our nervous system. Friction tape can remedy an electric wire insulation defect, but tampering with the insulation protecting the nervous system means impairing one of the most complex structures known to science.

Every athlete, no matter what the sport, needs full and complete control of his senses (nervous system) or he may fail in the "pinches." This is just as true of students, doctors, lawyers, or any other work because, whether it is coach or boss, the best man will have the job, the man with the quickest reflexes, the best nerves, and the greatest endurance.

#### References and suggested reading:

Health & Human Welfare by Burkard Chambers and Maroney — Publishers, Lyon & Carnahan, 1937, pages 343 to 373.

New General Biology by Smallwood, Reveley and Bailey — Publishers, Allyn & Bacon, 1929, pages 329 to 336.



# ICE HOCKEY FUNDAMENTALS AND TECHNIQUES

By George P. Geran

Player with puck is boss of the game; perfection of arm and wrist action determines shooting skill.

This is the first of a series of two articles by George P. Geran, a member of the 1920 United States Olympic ice hockey team. The author played professional hockey with the Boston Bruins in 1925 and later was a scout for the New York Rangers.

**I**CE HOCKEY is one of the fastest games on earth. No other game demands more lightning-like action and split-second execution of plays. As a result of this accent on speed many faults of a player go unobserved; faults which may soon fasten themselves like barnacles to impede a player's progress.

Not all these shortcomings are ones of actual playing ability, some are mental. A player's confidence can be developed by making him realize that he is absolute boss of the game when he has the puck. It is within his power to control the play. Therefore he should retain the puck until he can shoot or pass to his team's advantage. Should he elect to rush the puck and circle behind his defensive goal, he should not skate at full speed as this may also accelerate the opponents' pace. By skating at moderate speed he allows for a change of pace which may enable him to knife through the opposing forwards in mid ice, thus reducing the odds in the scoring sector.

Too much energy and effort are wasted in the so-called dead areas. It is much better to shoot or make a play from in front of the net than from a corner where scoring possibilities are dimmed by force of numbers and the awkward angle. An intercepted pass-out from the corner will leave the offensive player in a poor position to drop back and help on defense.

When an attacking player finds himself forced into the corner, here again the "boss of the game" thought should be applied. Retain the puck and stick-handle out, or abandon it to insure against being left out of the play when a true pass to a teammate is impossible. The situation can be well handled by a player who has mastered the art of carrying the puck with his head up. Passing is accurate and never to an opponent who pretends to be a teammate. The knack of skating with the head up also enables a player to plan a more advantageous attack from the start, as he can survey the entire surface of the ice. Like everything else, the technique can be acquired by daily practice.

The first fifteen minutes of the practice session may be devoted to informal play. During this period the coach can drop a hint to certain players weak in stick-handling and dribbling to go out and "hog" the puck, and when lost try to retrieve it. Informal "ragging" of this nature against opposition is bound to improve his stick-handling ability. The drill also prepares the player for actual game situations in which the team is short-handed through penalties. A good stick-handler has held the fort many a time until his team was restored to full strength.

Players who are inaccurate shots each may be given a puck and sent over to the side of the rink with directions to shoot from a ten foot distance at a mark about a foot in height from the ice. A few metal discs suspended on a line over the side boards will allow for several men to practice at the same time. Five or ten minutes of this practice per day will sharpen the shooting "eye."

## Shooting technique

Keep in mind that to shoot accurately in hockey involves a principle just opposite to that in golf. In golf, it's keeping the eye on the ball; in hockey, start the shot and look up at the mark before the puck leaves the blade. Don't bring the stick up too far. Aim the blade toward the target and keep it there even after the puck has left in flight.

Many players shoot across their bodies in a more or less stereotyped fashion. Good scoring opportunities may be wasted because of the time taken by the player before shooting to turn his body at a right angle to the goal. The shot should be executed by the arms and wrists and not with the stiff shoulder movement employed by the vast majority of players.

After shooting at a mark on the puck board from a stationary position, a player can best develop the arms and wrists shot as follows. Let us assume that a player is a right-handed shot; after mastering the cross-body shot, he should face the target squarely with the knees bent to facilitate arm movement, and shoot from that position. The head is always up and the eyes on the target (after once starting the shot).

At first the puck may not rise from the ice and the position may seem

awkward. But as the wrist flick is perfected this difficulty is overcome. Next, turn the body slightly more to the left and the arms and wrists action will become more natural. By diligent practice every day the player will be able to stand in the middle of a clock dial, figuratively speaking, and have a shooting range from ten o'clock to two. After perfecting the above shooting range from a stand-still position the player should then learn how to shoot while in motion.

## Two hands on stick

One of the basic fundamentals of hockey is for a player to keep both hands on the stick. Players should be able to skate with the blade of their sticks close to the ice in readiness to receive passes. Proper pass reception is important of course. A ball player will receive a throw well back on his right side with his arm cocked for the return. But for some reason most hockey players, even some of the stars of the game, will take a pass and waste a second or two jockeying it into shooting position, thereby telegraphing the shot and allowing the goalie to get set. It's just as easy to take a pass on the shooting spot and let go at the goal immediately while the goalie is still shifting.

Even a goalie should keep both hands on the stick. He will be able to use either hand with a count of one instead of one-two which a shift from one hand to the other necessitates. Second savers are often the difference between victory and defeat.

The two-hands-on-the-stick principle is also important for a player's protection. A player should be taught how to protect against having his stick hooked up while he is carrying the puck. Lowering the arms to one side will make an opponent miss his intended hook, but the puck carrier should either pull his head over to avoid the blade of the missed hook or extend his elbow and take the blow on his arm.

When skating between two defensive men a player should go through with upraised arms bent at the elbow. The arms will act as shock absorbers and temper the shock of the bump. The puck can be allowed to slide through and picked up after a successful passage, because the defense,

(Concluded on page 27)



## BASKETBALL IS TOUGH ON THE FEET

**A**NKLES and feet take twists, turns and short stops aplenty on the courts. There's an ACE Ankle Roller that supports the ankle without bulk. It can be worn under the shoe and still permit free ankle movement. The ACE Bandage provides coolness and comfort because it is porous. The ACE Ankle Roller is described in the ACE Athletic Manual, a copy of which was mailed to every high school and college coach. If you did not receive your copy, just ask us for one.

## ACE BANDAGE

**ELASTIC without Rubber  
and WASHABLE**

Sold Through Sporting Goods  
Dealers and Drug Stores

**BECTON, DICKINSON & Co.**  
RUTHERFORD, N. J.

## Quarterback's Tribulations

By Ralph E. Hensley

**Y**OU know, I don't understand football coaches. All fall the coach has been worming his way into the huddle and calling plays. Every scrimmage session he does the same thing. And yet I was supposed to outsmart the Red team yesterday all by my lonesome in four easy quarters. Why, doggone it, I haven't had one real practice at calling signals all season, but I'm not alibi-ing. When we got our only chance to score in the third quarter with the ball on the seven-yard line and four big juicy downs to put her across, I followed instructions to the letter, and did I get bawled out when he pulled me out of the game.

It was like this. For the last two weeks the coach has been spending hours, and I mean hours, drilling us on 32. That's the power play that goes over our strong side directly behind our two guards. Coach would hand us the ball on the ten-yard strip and tell us to put her over. Well, watching the dumb scrubs calling signals and sneaking into the middle of the line, I would outsmart 'em with a sweep around the end or a delayed spinner. Then, shrieking like an ambulance siren, the coach would yell, "32, 32, 32, you dumb idiot!"

So in the Red game with four downs to go and 32 rhyming in my brain I 32'd 'em to death—and gained exactly one foot in the four plays. It was just like playing against the scrubs; the Red linemen just ganged up in the middle and we couldn't budge 'em. I'll bet we might have scored if I could have used my own judgment. And when I said, "I sure threw 32 at 'em coach," as I came into the bench that inconsistent guy mumbled, "Why don't you use your head once in a while."

### Volunteer strategists

Two weeks before the Red game I would have sworn that I'd never start a game. The fullback's father, one of the richest men in the community and hailed by the school paper as the team's staunchest supporter, helped the coach with the team strategy one day by suggesting that his son be moved from fullback to my job as ball-carrying quarter, and that one of the big guards could be moved back to the blocking back spot. All that moving just moved me right into the second string lineup. It was for the good of the team,

but you know, if I was coaching a football team I wouldn't have so much volunteer help. It turned out O.K., however, because the big dummy who was shoved into my position couldn't learn his new assignments. I didn't care so much because I had the second team pulling so many fast ones on the first stringers that they were lucky any time they could hold us to a tie.

I had some fun making up my own plays. Packing the ball from the tailback spot is a cinch if I am allowed to do my own steering, 'cause I can swing wide if the ends get too smart, or cut in if the tackles try sneaking in where they don't belong. And I found out that if you call a 37 over the off-tackle hole you can still go way inside or way outside of the hole and still break away. That's why I had so much fun on the second team. I could pick my spots freely although I had to fool my own linemen once in a while so they wouldn't give away the plays.

### Trouble in paradise

In the second quarter of the Red game I was having the time of my life running plays the way I wanted to, but peeking over at the bench I saw coach fuming. I figured it wouldn't be long before I would have a nice long rest, so knowing I was going to catch it anyhow, I really cut loose and had a grand time. I would kid the dickens out of each guy that didn't block his man and let the boys in on two plays at a time so we could fool 'em. I would give the wrong signals to our pointers—fellows who give away plays—and then pat 'em on the back when they did some good blocking. Boy, were we mowing those Red footballers down! Around the end, a fake and a cutback, around the end again, a safe pass from the cutback play, and then a reverse.

I was breaking down the coach's favorite system of plays but we were moving down the field like a truck through traffic. Every guy on the team was hustling and we were rolling off first downs one after the other. The Red backs would come up to stop the running plays and we would toss passes right over their heads. The Red line would over-shift and we would reverse. They would under-shift and we would outrun them. They spread and we would spin or sneak inside tackle. But none of it was according to the coach's system, he calls it a sequence of plays, so I knew what was coming at the half. It came too.

Funny thing, though, the coach yelped the loudest about our poor work in getting punts away. And you know, thinking back I remember only



one practice session on getting punts away. Oh yes, there was a blackboard drill on it too after practice one afternoon, but everybody was so tired and eager to get home that I'll bet no one heard over two words of what coach was talking about. It seems to me that if getting punts away is so important we would practice it more. Gosh, we have run through our sequences of plays a million times.

### Dr. Jekyll or Mr. Hyde?

Every time I think I got that coach of ours figured out, he pulls something new and I am at loss to guess what's coming next. I play safety and a guy gets plenty of time to think back there alone. All afternoon yesterday in that Red game I watched those ends coming down under punts and they didn't look so good, but coach says to catch 'em and head up the middle, so I did it and didn't average over five yards a return. One of the coach's pet gripes at me is handling punts inside my own twenty. His orders are not to do it. But towards the end of the game as that Red team was plugging along and backing us up to our own goal line, I saw a quick kick sailing towards me while I was standing on my goal line.

I just couldn't resist 'cause those ends were cutting in fast to take me in the middle just like they had been doing all through the game. I faked in and then slipped around 'em and galloped forty yards before a guard knocked me out of bounds. It was fun but I could just hear the coach saying, "You dumb baboon, how many thousand times have I told you not to handle punts inside your own twenty?"

So when the final gun sounded I crept into the dressing room trying to keep out of sight as long as I could, but doggone it if I didn't walk right smack into the coach. You know what that screwy guy did? He reached out and patted me on the back and said, "Nice game, feller." We hadn't won either. Gee, I thought he would raise the roof.

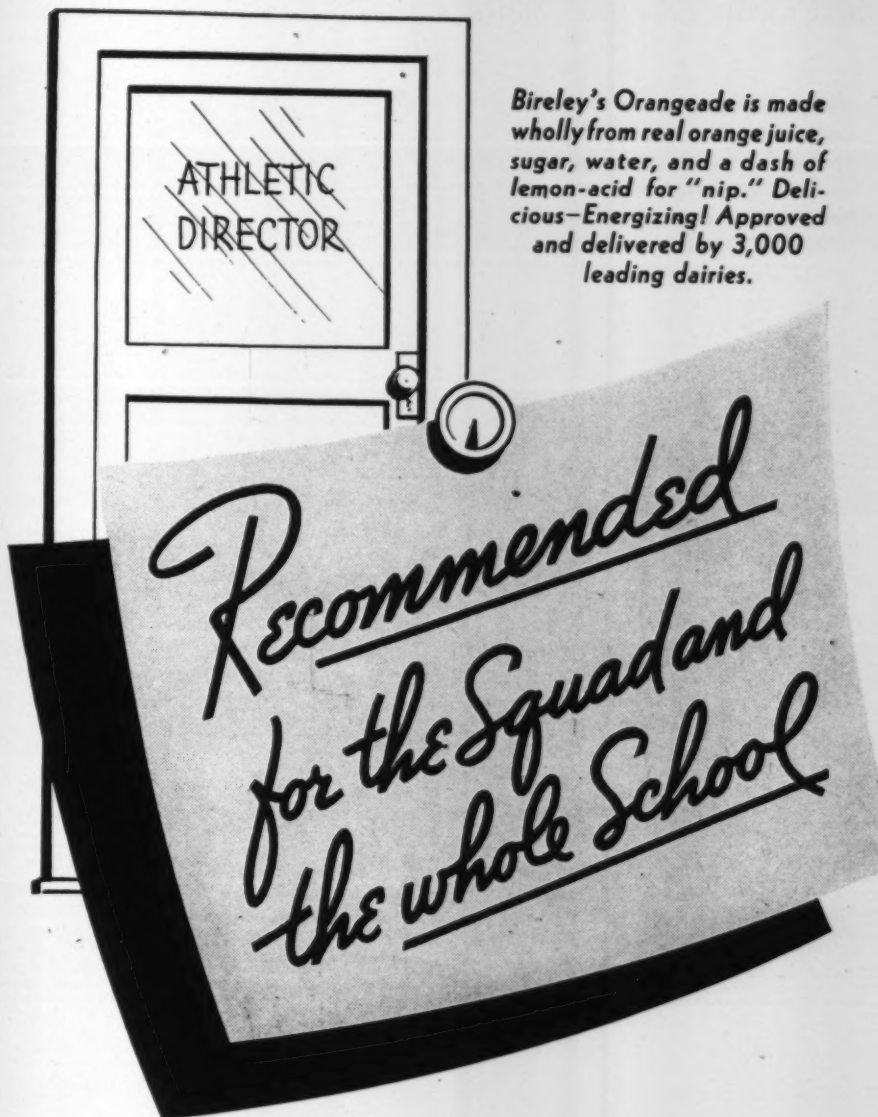
### STUDENTS WIN STRIKE

**But Keyport, N. J., Youths Must Make Up Lost Time**

*To the New York Times*

KEYPORT, N. J.—Most of the 325 pupils of the Keyport High School who went on strike yesterday because the Board of Education had announced a curtailment of interscholastic athletics were back at class victorious, but not 100 per cent satisfied with the outcome.


They received assurances from Principal J. O. Hartsler that no change would be made in the athletic program. However, in the next breath, Mr. Hartsler reminded the demonstrators that the time lost from their studies would have to be made up, victory or not.



**Bireley's Orangeade is made wholly from real orange juice, sugar, water, and a dash of lemon-acid for "nip." Delicious—Energizing! Approved and delivered by 3,000 leading dairies.**

*Recommended for the Squad and the whole School*

**R**ESPONSIBLE for the health program of the whole student body, the athletic director gladly okays Bireley's Orangeade. New beverage for his training-diet. Grand after-practice pickup. Wholesome cold drink to recommend to the whole school. (The sweets they want in a form that's good for them). And as an alkalizer at bedtime Bireley's Orangeade—hot or cold—helps everybody ward off colds and flu through the winter. Send for quart to sample—delivered free to athletic directors. Just use coupon.



**BIRELEY'S Orangeade**

NON-CARBONATED

BIRELEY'S, INC., Hollywood, Calif. SM 59-37

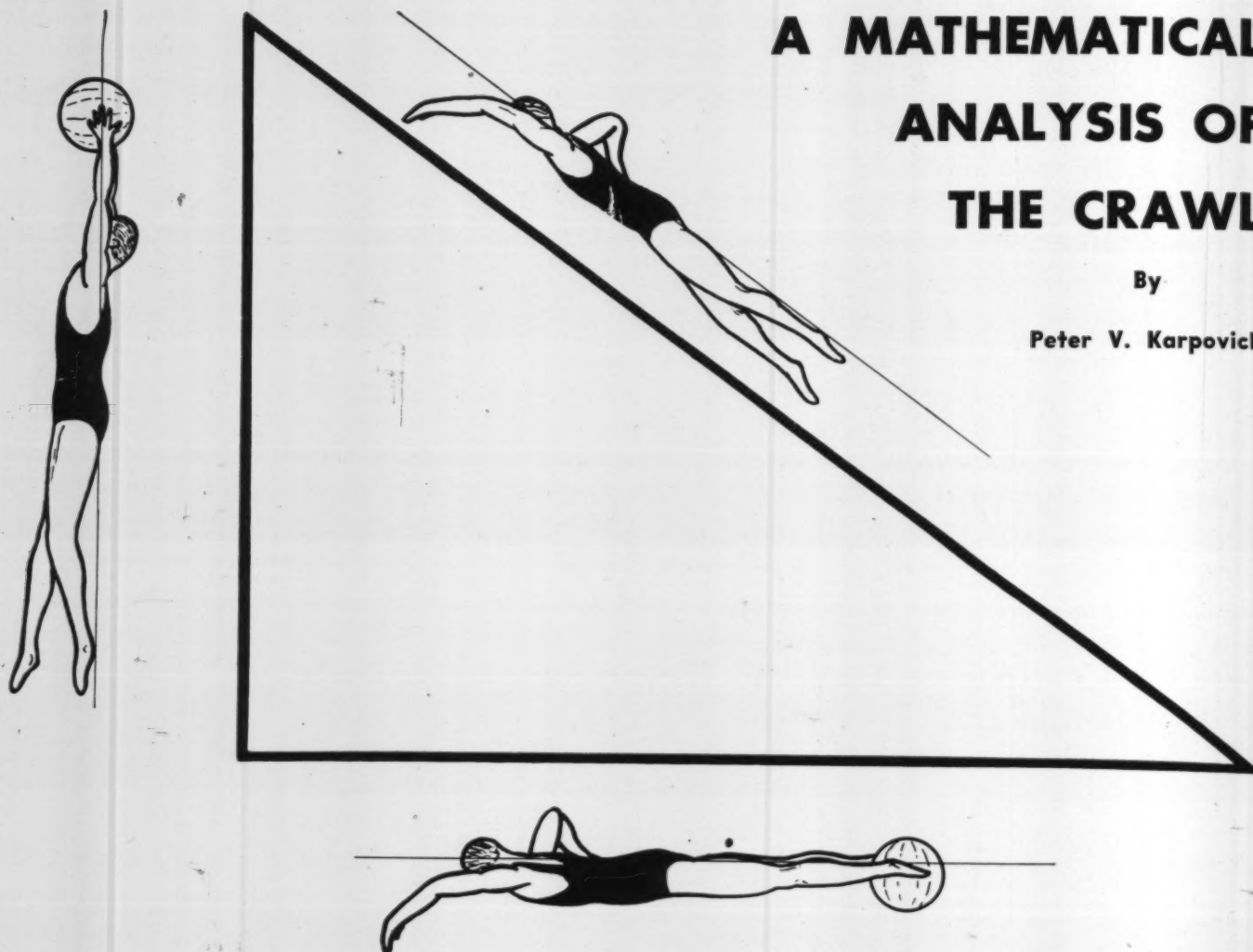
Gentlemen: Please deliver free quart of Bireley's Orangeade.  
(Open only to Athletic Directors and Coaches)

Couach's Name \_\_\_\_\_  
School \_\_\_\_\_  
Street \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_

# A MATHEMATICAL ANALYSIS OF THE CRAWL

By

Peter V. Karpovich



Our old friend of school days, the Pythagorean theorem, which we then used to measure the distance across an unnamed lake, now turns up as a means of measuring the relative propelling force of the arms and legs in swimming. Peter V. Karpovich, M.P.E., M.D. and a professor of physiology at Springfield College, Mass., has applied this theorem to measuring swimming skill.

**S**INCE success in swimming is controlled by such factors as organic efficiency, proper body position and coordinated arm and leg action, it follows that an improvement in any of these factors should result in more skillful swimming.

From the standpoint of organic efficiency, the coach is mainly concerned with the prevention of staleness resulting from overfatigue, since the swimmer's organic efficiency will increase through any good practice exercises. Hence, in order to discover weaknesses and to suggest corrections, a complete analysis of swimming strokes is necessary.

The mechanics of the stroke require detailed study. Although it is relatively simple to pick out the faults of a poor swimmer, judgment becomes more difficult when the swimmer attains some measure of skill.

Consider the crawl stroke. Coaches

generally agree on what constitutes good or bad body position, but when it comes to speed swimming one school teaches a "flat" body position while other coaches still favor the "hydroplane" type position.\*

The discussion becomes even more involved when arm and leg action is evaluated. Without taking into consideration the direction of the arm pull, there is never any assurance that either the arms or the legs are generating sufficient power.

## Pythagoras' discovery

In his studies of the physiology and mechanics of swimming, the writer chanced upon a very simple relationship between the arm and leg action in the crawl stroke, a relationship based upon the famous Pythagorean theorem.

More than two thousand years ago Pythagoras discovered that the sum of the squares of the sides of a right triangle is equal to the square of the hypotenuse. This is one of the most interesting theorems of elementary geometry, and has been greatly re-

sponsible for progress in surveying and architecture, as well as in the field of mathematics.

Surprisingly, this Pythagorean theorem may be applied in the analysis of the crawl stroke. The subject is asked to swim at maximum speed one length of the pool three times (a 60-foot pool is more convenient than a 75-foot one), first using arms alone, next legs alone, and finally the whole stroke. After each test he rests for a few minutes. When only the legs are used, the feet are supported by a slightly deflated water polo ball tied between the ankles by a special strap. When the legs alone are used, the same ball is held in the hands with the arms extended forward. The swimmer employs a dead start through the entire test.

In order to eliminate errors due to differences in reaction time, the start is given in the following manner: "Get ready, one, two, go." The time intervals between "one," "two," and "go" are equal. The starter always holds the swimmer by the ankles and releases him on "go." The subject is instructed to hold his breath as long as possible.

## Theoretical argumentation

To show the speed of each trial in feet per second, a right triangle is drawn to a scale, so that one side is equal to the speed of the arms and the

\*By experiment the author showed the disadvantages of "hydroplaning." His findings were published in the Apr., 1934, *Scientific American* under the title, "How Not to Swim Faster."



other side is equal to the speed of the legs. The hypotenuse will be equal to the speed of the whole stroke. (See illustration.) This is called the Law of the Squares and may be stated as follows: *The square of the speed of the whole crawl stroke is equal to the sum of squares of speeds developed with arms and legs separately.*

Here is the theoretical argumentation. In a whole crawl stroke we have the summation of the propelling forces developed by the arms and legs. Let  $F_w$  be the propelling force of the whole stroke,  $F_a$  the propelling force of the arms and  $F_l$  the propelling force of the legs. Assuming that there is no loss we can write  $F_w = F_a + F_l$ . But propelling force is equal to water resistance. Substituting water resistance for the corresponding force we have:  $R_w = R_a + R_l$ . Since water resistance may be expressed approximately as a product of coefficient ( $k$ ) and square of speed we can write:

$$kV_w^2 = kV_a^2 + kV_l^2, \text{ or } V_w^2 = V_a^2 + V_l^2.$$

In the preceding calculation it is assumed that there is no loss of power when the arms and legs act together. In general this assumption is wrong. The sum of forces of two groups of muscles acting separately is usually greater than the force developed when they work together. But in our case due to the use of the ball, an extra resistance is added, which perfectly balances the difference.

It is obvious that neither the drawing of triangles nor the calculation of squares of speed with a subsequent extraction of a square root are very tempting procedures. To simplify this a table (Table I) has been prepared which makes it possible to get the results in less than half a minute.

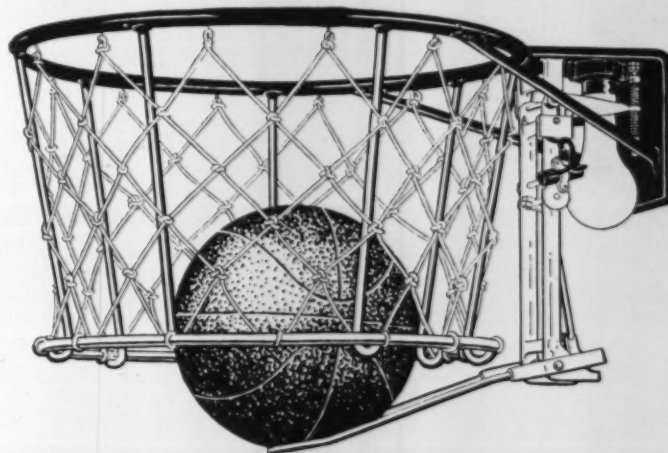
It is only necessary to know the swimming time; the corresponding square of the speed will be found in the table. Although this table was prepared for a 60-foot tank, it can be used for a tank of any other length. (Naturally, if a tank of any length other than 60 feet is used,  $V^2$  will not be the square of speed, but merely a score. The procedure will remain the same.)

Used properly this test has a far-reaching diagnostic value. It provides a means to detect weakness of either arms or legs and also to ascertain whether coordination is good or bad.

After finding the time for arms and legs separately, Table I should be used to predict the time for the whole stroke. If the actual time of the whole stroke is the same as the predicted time or the difference is not more than .3, the swimmer's coordination is good. If the actual time is slower by more than .3 of a second than the predicted time, coordination is imperfect.

In order to discover whether it is the arms or the legs which are at fault, compare the results of the test with Table 2. Suppose a man swims 60 feet in 12 seconds, his arm time being 13 seconds and his leg time, 31.4 seconds. According to his whole-stroke time he belongs in group 4. However, his arm stroke is good enough to place him in

(Concluded on page 24)



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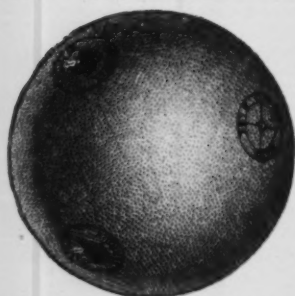


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group 3. It is only because his legs are very weak (they belong in group 7) that his total time is so slow. It is evident that this swimmer should concentrate his attention on leg action.

In conducting this test it is important to avoid breathing, since respiration slows down the speed and introduces the possibility of errors. This is especially noticeable in the leg test of poor swimmers.

With the aid of this test it is now possible for the first time to measure objectively the relative importance of the arms and legs in the crawl stroke. Tests conducted with a large number of Springfield College students show that good swimmers who can swim 60 feet in 9.5 seconds, derive 69.56 percent of their propelling force from

their arms and 30.44 percent from their legs; whereas, in poor swimmers who require 17 seconds to swim 60 feet, the arms contribute 77 percent of the propelling force and the legs only 23 percent.

**Table II**

Showing the Average Relation Between the Effectiveness of the Arms and Legs, and the Whole Stroke

Time of swimming Whole Stroke	60 feet with maximum speed in seconds	60 feet with maximum speed in seconds	
		Arms Alone	Legs Alone
1	9-10	11.3	17.6
2	10-11	12.2	18.4
3	11-12	13.2	21.2
4	12-13	14.1	23.6
5	13-14	15.1	26.2
6	14-15	16.4	30.8
7	15-21	20.0	32.4

**Table I**

T=Time; V<sup>2</sup>=square of speed.

T	V <sup>2</sup>	T	V <sup>2</sup>	T	V <sup>2</sup>	T	V <sup>2</sup>	T	V <sup>2</sup>	T	V <sup>2</sup>	T	V <sup>2</sup>
9.0	44.36	14.0	18.40	19.0	9.99	24.0	6.25	29.0	4.28	37.0	2.63		
.1	43.56	.1	18.15	.1	9.86	.1	6.20	.1	4.25	.5	2.56		
.2	42.51	.2	17.89	.2	9.73	.2	6.15	.2	4.22	38.0	2.50		
.3	41.60	.3	17.64	.3	9.61	.3	6.10	.3	4.20	.5	2.43		
.4	40.70	.4	17.39	.4	9.55	.4	6.05	.4	4.18	39.0	2.37		
.5	39.82	.5	17.14	.5	9.43	.5	6.00	.5	4.15	.5	2.31		
.6	38.94	.6	16.89	.6	9.36	.6	5.95	.6	4.11	40.0	2.25		
.7	38.32	.7	16.65	.7	9.24	.7	5.91	.7	4.08	.5	2.20		
.8	37.45	.8	16.40	.8	9.18	.8	5.86	.8	4.05	41.0	2.14		
.9	36.72	.9	16.24	.9	9.06	.9	5.81	.9	4.02	.5	2.09		
10.0	36.00	15.0	16.00	20.0	9.00	25.0	5.76	30.0	4.00	42.0	2.05		
.1	35.28	.1	15.76	.1	8.94	.1	5.71	.1	3.97				
.2	34.57	.2	15.60	.2	8.82	.2	5.66	.2	3.95				
.3	33.99	.3	15.37	.3	8.76	.3	5.62	.3	3.92				
.4	33.29	.4	15.21	.4	8.64	.4	5.57	.4	3.90				
.5	32.60	.5	14.98	.5	8.59	.5	5.52	.5	3.87				
.6	32.04	.6	14.82	.6	8.47	.6	5.48	.6	3.85				
.7	31.48	.7	14.59	.7	8.41	.7	5.43	.7	3.82				
.8	30.91	.8	14.44	.8	8.29	.8	5.38	.8	3.80				
.9	30.25	.9	14.21	.9	8.24	.9	5.34	.9	3.77				
11.0	29.81	16.0	14.06	21.0	8.18	26.0	5.32	31.0	3.75				
.1	29.27	.1	13.84	.1	8.07	.1	5.28	.2	3.70				
.2	28.73	.2	13.69	.2	8.01	.2	5.24	.4	3.65				
.3	28.20	.3	13.54	.3	7.95	.3	5.20	.6	3.61				
.4	27.67	.4	13.32	.4	7.84	.4	5.16	.8	3.56				
.5	27.14	.5	13.25	.5	7.78	.5	5.13	32.0	3.52				
.6	26.73	.6	13.03	.6	7.73	.6	5.09	.2	3.47				
.7	26.32	.7	12.89	.7	7.67	.7	5.05	.4	3.43				
.8	25.50	.8	12.82	.8	7.56	.8	5.01	.6	3.39				
.9	25.40	.9	12.60	.9	7.51	.9	4.98	.8	3.35				
12.0	25.00	17.0	12.46	22.0	7.45	27.0	4.94	33.0	3.31				
.1	24.60	.1	12.32	.1	7.40	.1	4.90	.2	3.27				
.2	24.21	.2	12.18	.2	7.34	.2	4.87	.4	3.22				
.3	23.81	.3	12.04	.3	7.29	.3	4.83	.6	3.19				
.4	23.33	.4	11.90	.4	7.18	.4	4.80	.8	3.15				
.5	23.04	.5	11.77	.5	7.13	.5	4.76	34.0	3.11				
.6	22.66	.6	11.63	.6	7.08	.6	4.73	.2	3.08				
.7	22.28	.7	11.49	.7	6.97	.7	4.69	.4	3.04				
.8	22.00	.8	11.36	.8	6.92	.8	4.66	.6	3.01				
.9	21.62	.9	11.22	.9	6.86	.9	4.63	.8	2.97				
13.0	21.34	18.0	11.09	23.0	6.81	28.0	4.59	35.0	2.94				
.1	20.98	.1	10.96	.1	6.76	.1	4.56	.2	2.91				
.2	20.70	.2	10.82	.2	6.71	.2	4.53	.4	2.87				
.3	20.34	.3	10.69	.3	6.66	.3	4.50	.6	2.84				
.4	20.07	.4	10.63	.4	6.55	.4	4.46	.8	2.81				
.5	19.71	.5	10.50	.5	6.50	.5	4.43	36.0	2.78				
.6	19.45	.6	10.37	.6	6.45	.6	4.40	.2	2.75				
.7	19.18	.7	10.24	.7	6.40	.7	4.37	.4	2.72				
.8	18.92	.8	10.18	.8	6.35	.8	4.34	.6	2.69				
.9	18.66	.9	10.05	.9	6.30	.9	4.31	.8	2.66				
14.0	18.40	19.0	9.99	24.0	6.25	29.0	4.28	37.0	2.63				

Reprinted from the Supplement to the Research Quarterly, Vol. 6, No. 2, May, 1935

The use of Table No. 1. Let 12.2 s. and 20.3 represent the time for the arms alone and legs alone. The corresponding squares of speed will be found in the columns marked V<sup>2</sup>. For 12.2 it is 24.21 and for 20.3 it is 8.76. To predict the speed for the whole stroke add the found squares. The sum is 32.97. Read back into column V<sup>2</sup> and find a number nearest to 32.97. It will be 33.29. The corresponding time in column T will be 10.4. This is the predicted time for the whole stroke. (Although this table has been prepared for a 60 foot tank, nevertheless it can be used for any length tank; in that case V<sup>2</sup> will be merely the score, but the use of the table remains the same.)



## The Figure 8 Offense

(Continued from page 7)

to position A. All breaks toward the basket should be at top speed, while all cuts away from the basket should be at a much slower pace.

In **Diag. 5**, 1 has completed the first half of the "Figure 8" and once more will handle the ball. Play continues as in **Diag. 1** except that 1 will now pass to 2 at 3's original position and will cut for position A at the basket. The rotation may be continued indefinitely. The constant maneuvering of the players and the rapid handling of the ball keeps the defense milling and makes it possible for the team in possession to keep the ball for protracted periods. The spectators seldom object to this type of stalling during the closing moments of a game, since the players keep driving in to the basket as if intent on scoring. It is a very tiring game for the defense.

The players need to remember but one thing—after making a pass to cut down the middle of the floor for the basket in front of two teammates. They should form the habit of watching the ball while cutting and of hesitating at the side of the basket until the next player enters the free-throw circle.

The rotation may be interrupted at any time to return the pass to the original passer for a scoring attempt. This is shown in **Diag. 6** where 1 returns the

pass to 5. (A low pass here is usually most effective.) Two other scoring possibilities are indicated in the same diagram. Every passer must constantly be alert for a quick pass to the man at the side of the basket. The long pass from 1 to 4 is difficult for the average right-handed high school player, but if it can be made successfully, 4 will be in an ideal position to score.

The pass from the other side of the floor, 5 to a man in the B position, is much easier to make, but the shot is more difficult. 1 also has the option of passing to 2 who has continued his cut to the basket instead of pulling out to position 5. The break should be timed so that 2 will trail 5 by about 15 feet. If 2's guard plays him too closely as he (2) comes up the side-line even with the foul line, the set-up is ideal for a sudden reverse to the basket.

### Set-up changes to 2-3

It may be noticed from the diagrams that a 2-3 set-up is used after the opening play, and that the "clock" may be wound by passing to the left as well as to the right. While the players are rotating, the ball actually travels back and forth across a very small area. The tendency of most defenses is to bunch around the free-throw circle with the

front men gradually edging out to attempt an interception. This sets the stage for the reverse shown in **Diag. 7**. As soon as 1 receives the ball, he pivots and shoots the ball down the outside to 3 who bounces it quickly to 2 at the pivot position. 2 has the possibility of passing to 1, who has cut behind 3, to position B; of returning the pass to 3 for a set shot; or, of trying for the goal himself.

The reverse, which changes the play from "going-in-front-of-the-receiver" to "going-behind-the-receiver," is a very effective offensive weapon. In **Diag. 7** if 5 has continued rapidly to position B, a double reverse would have been possible by 3 pivoting to the outside and bouncing a one-handed pass to 5 under the basket. In that case 3 should follow the pass for the rebound or a possible return pass if 5 finds it impossible to shoot from that position.

**Diag. 8** is a variation of **Diag. 1**. After passing, 1 sets up a screen for 2 who passes immediately to 3 and cuts around the screen for a return pass and a quick dribble to the basket. In case 3 does not return the pass, 1 takes position 2, 2 takes position B, and the "merry-go-round" keeps whirling. Though simple, this screen play works in well with a "Figure 8" offense.

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# Philosophy of Athletics

(Continued from page 14)

attention, frequent day-dreaming, keen emotions, strong sense of honor, lack of understanding of adults' viewpoint, and a narrowing interest to a few games. The physiological traits are: rapid growth, retarded heart development, awkwardness, susceptibility to fatigue, etc.<sup>10</sup> These characteristics make games of high organization undesirable for the student of junior high school age.

In this period of which we have been speaking, the individual departs from the drill work of the past years and instinctively desires to use his own initiative and to express his own personality. This period, according to all educational principles, is devoted to more generalized courses and a gradual approach to specialization. In this transitory period, as it is called, group games of an intramural nature should be taught, in which the student through competition with his teammates may catch the spirit of those social morals and civic qualities which in turn enable him to understand the meaning of cooperation and other desirable characteristics of the senior high school level.

## Senior high student traits

The average senior high school student possesses the following traits: greater power of attention and reasoning, marked development of self-confidence, better control of emotions, loyalty, love of adventure, narrowing of interest toward specialization, and the developing of life interests and ambitions. The physiological traits are: slowing-up of growth, heart has developed in proportion, development of strength and endurance, and better control of bodily movements.<sup>11</sup> These characteristics make games of high organization desirable. The games

should be highly competitive and emphasis should be placed on those who are inclined to be interested in interscholastic athletics. This emphasis should not throttle the rest of the physical education program in the senior high grades.

The argument that people who direct interscholastic teams should not be concerned with the rest of the physical education program is misleading and untrue on account of the veracity of the following statements. First, the majority of schools in most cases cannot afford a coach and a separate teacher for physical education. Second, the matter of duplicating equipment and facilities is necessary, and administrative procedures are made simpler. Third, belief that directors of interscholastic teams will neglect the complete program and stereotype physical education in order to further the interscholastic program is groundless; this is no more true than to say that an individual teaching history and coaching will neglect his history if he is interested at all in the complete educational program. We fear that in most cases the lack of interest in one or the other is due to improper administration. Fourth, a coach connected with the physical education program, other than coaching the interscholastic teams, will be kept in contact with the general educational principles and policies, and with the general doings of the student body. This contact will help him better to keep a balanced educational program in all school activities. Fifth, it is almost impossible for a coach to be sympathetic toward the rest of the physical education program unless he has to divide his team and efforts among the various phases of it.

## As coaches and as teachers

As coaches we should want to teach the different activities; as teachers we should want to coach the different sports. Such a proceeding is for our permanency; it is for our existence; it is for our posterity. We must not be afraid of failure. If this emphasis is in the wrong place, we must try to right it; we must not be discouraged; we have a profession, so let us face the problems as professional men.

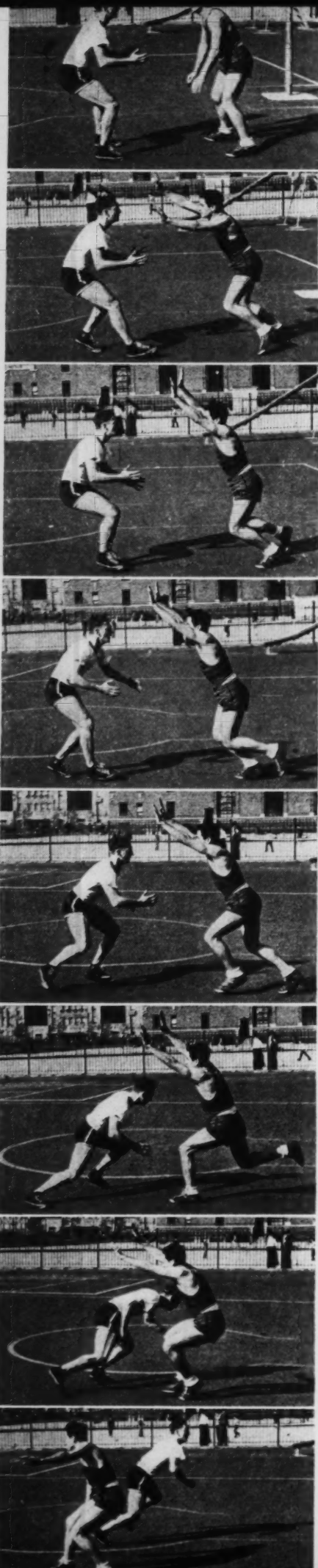
We must realize that it is rather difficult for us to measure our success in teaching. We do not know when a student has secured the traits we have indicated; neither do we know to what degree he has learned, nor when. But we must be satisfied to believe that so long as we make a desperate effort to teach, we may be compensated. We can measure organic development in some degree; we can measure skills. Is it not then our problem to make an effort to measure in some degree likewise social moral traits?

## Fall Back Stunt

If you are adept at faking eye and hand motions, here's a good stunt to pull on an out-of-bounds ball on the end line under your own basket. From a position close to the basket, the offensive player starts falling back and with eye and hand motions calls for the ball. The guard, fully aware of their proximity to the basket, rushes in with upraised hands to break up the pass. Like a flash the offensive player ducks under his guard's arms and drives in for a scoring pass under the basket. Against a too conservative guard, the player can fall back, take a pass and shoot.

<sup>10</sup> Tracy, Frederick, *The Psychology of Adolescence*, pp. 10-23.

<sup>11</sup> *Ibid.*





## Ice Hockey

(Continued from page 19)

as a rule, play the attacker and not the puck.

Feinting is a neglected art in hockey. A dodge or pass preceded by a feint forces the opponent to make the first move. A fake shot at goal outside the defense will often force the defensive man to assume a momentary legs-together position to block the shot. With a few quick movements the carrier can storm inside home in a good position to shoot.

Too many goalies after stopping a shot think only of clearing the puck into a corner. A clever goal tender often can hold the puck long enough to lure an opposing forward in close, and then pass the puck forward to a teammate; a maneuver that keeps the opponent temporarily out of play.

During the first fifteen minutes of informal practice the goalies should do some skating and stick-handling, an important item often overlooked. The next fifteen or twenty minutes may be occupied by the forward line rushing the defense. Development is often aided by instructing the defense to remain stationary and the forward line to first skate very slowly through the motions. Then both the offense and defense can go through the play at top speed. Development is often impeded by rushing things at the outstart.

The remaining time can be used to scrimmage. Usually it is a good policy to pit the first string forwards against the first string defense.

### Practice off the ice

For teams deprived of ice during the playing season (due to weather conditions) and also for the pre-season training period, there are a few things that may be considered. The players can brush up on technique and team play through skull practices and blackboard talks.

Shooting practice on a cement or gymnasium floor is excellent for wrist development. Naturally it will take a little time to reaccustom one's self to the faster ice surface. Avoid running. Ride a bicycle or a bicycle machine as the same leg muscles are employed in skating. For sports, handball and soccer are excellent. Soccer entails running but the benefits derived from dodging are well worth it.

Above all, don't over-indulge. In this respect don't scrimmage or practice hockey too long. To many teams have left their best efforts on the practice ice.

Next month, the author will cover offensive and defensive team play.

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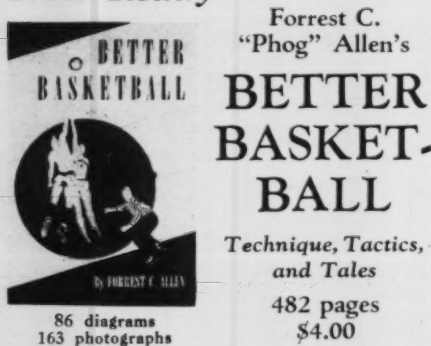
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## Coaches' Corner

If you have something for this column send it to Bill Wood, University High School, Iowa City, Iowa.

**It could happen** only in California. A novel way of crashing the gate was reported by the Rose Bowl officials recently. It seems that a year or so ago a man with a long pole came running full tilt toward the ten-foot concrete wall at one end of the stadium. Without losing his hat he sailed over with a yard or so to spare. The officials let him stay. Out our way we would give him a house and lot, pay his tuition for four years, put him on the N.Y.A., and afterwards mount him as a museum piece.

**A high school coach** asked one of his former stars how he liked eating at the college training table. "Well, everything is O.K. except the food. We don't get anything but vitamins."

**Lady Luck does smile.** Tall Jim Thynne, who led his team from tiny Melrose to a state championship last year, has moved to Sauk Center, Iowa, to complete his high school education. He has two years more of competition.

**When Coach Zuppke** of Illinois told his boys that he would die to win the Northwestern game, they promised him that they would win it in order to get rid of him. What a game they turned in for the man who is spending his twenty-fifth season as the most popular figure in Illinois.

**One of the most vivid** and exciting accounts of a football game that I have ever read appeared in the Jacksonville, Ill., *Daily Journal* following Illinois College's 13-7 triumph over Illinois Wesleyan. When I congratulated the writer, Ernest Savage, he sent me this reply:

"Thanks for your letter. I wondered what some of the readers thought of that story. The funny thing about it was that I didn't see the game. Was I able to make you see it, feel the tension of the situations, and the drama back of the events? I did write the story from notes obtained by Bill Clark, and from conversations I picked up other salient points which Bill had missed in recording what was probably one of the most glorious of football victories. I believe I could have written another column (the article covered practically a whole page) but then, after all, there were other football games that day."

**What do you think** of this idea by Coach Lloyd Dresser of Sibley, Iowa?

"Here is a stunt that helped me at a critical point in my basketball program last year, so I'll pass it on. We reached the finals of our sectional and were to meet Rock Rapids, a team which had defeated us during the season. Naturally the boys were jittery. In an attempt to quiet them, I had them dress an hour before the game. Then for forty-five minutes I made

them lie down and, with the lights low, turned on my radio. The boys relaxed and listened to some good music. We won, 31-27. It seems to me that coaches are faced quite often with the problem of relieving the pressure. The radio stunt helped once. Perhaps it might again."

**How's this** for a combination—coaching and prestidigitation? (Sleight-of-hand to you.) If any of you folks down Texas or Oklahoma way have been losing games unexpectedly you may have been up against that old magician, Bob Clark. Bob, who worked his way through Howard College performing tricks of magic and playing football, spends his summers and Christmas vacations on the vaudeville stage. As a member of the International Brotherhood of Magicians and a skilled artist in almost every phase of legerdemain, he is now one of the most popular entertainers in the Southwest. During his three years as coach of the Wheeler, Tex., teams he won one district championship. He is now coaching at Erick, Okla.

**Mighty nice** to be able to pull a long-eared halfback out of the hat at the right time or to make an opposing tackle disappear. The old Hindu rope trick ought to go pretty well in a basketball game. Even the shortest of guards could run up the rope and bat down anything coming in the direction of the basket.

**Coach Fred Trewyn** of Wakefield, Mich., after taking his team on a two hundred mile trip over icy roads, suggests that the most amazing thing about the modern traffic problem is the number of people who aren't killed.

**If you need** new equipment and the funds aren't available, just take a tip from the high school boys at Ashland, Ill. About thirty of them with Coach Traugher and Principal K. C. Pittman took to the cornfields of a friendly farmer to raise funds for their athletic association. Other loyal fans supplied the horses and wagons, the mothers made the lunch, and the boys did the rest.

Several hundred bushels of corn were picked during the two-day turnout. For each bushel of corn husked the boys received four cents for their athletic fund. The gallery of people who came to watch the boys work was so large that a dealer in farm machinery brought out a modern corn picker to demonstrate to the crowd. The "Husking Bee" assures the Ashland High School team of being one of the best equipped in the Middle West this year.

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BILL WOOD



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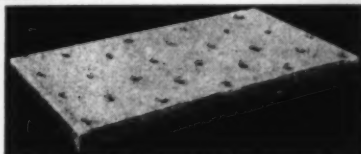
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## New Film

**E**NLARGING upon a tradition of movie reviewing, we unblushingly bestow eight very bright stars on the 16mm. sound film, "Basketball," distributed by Films, Inc. of New York. Surely such figures in the basketball world as the following merit one star each: John Bunn of Stanford, "Phog" Allen of Kansas, Dr. H. C. Carlson of Pittsburgh, Dave MacMillan of Minnesota, Clair Bee of Long Island University, George Keogan of Notre Dame, "Chuck" Taylor, Ambassador of Basketball; and last, but far from least, the brilliant Phillips "66" Oilers team from Oklahoma.

The film is divided into two parts of forty minutes each, each part complete in itself and available on a 1600 foot reel. Each coach is introduced separately and given an opportunity to express his theories of offense and defense. Then for approximately ten minutes he directs the players directly from the floor. The action is in semi-slow motion with the accompanying voice of the coach dubbed in.

Each man has something definite to emphasize: MacMillan stresses ball-handling; Allen, his stratified transitional man-for-man defense with a zone principle; Bee, set-shooting; Carlson, the famous Figure 8 offense of which he is originator; Keogan, the importance of fundamentals; Bunn, the fast break and zone defense; and Taylor (no relation to Robert) gave an exhibition of trick passing that even had us ducking under the seats to avoid getting beamed.

Our only criticism is leveled at the boys who did all the demonstrating—the Phillips "66-ers." They're just too good. They handle the ball, screen, shoot and pick rebounds off the backboards with a finesse that is amazing.

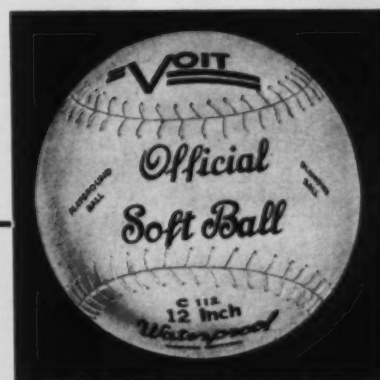
Incidentally, this is the same film that "Chuck" Taylor exhibits at his basketball clinics, sponsored by the Converse Rubber Co.

## New Books

**ZUPPKE OF ILLINOIS.** By Harold E. "Red" Grange. Pp. 179. Illustrated. Chicago: A. L. Glaser, Inc. \$2.

**O**NCE you plunge into "Zuppke of Illinois," you're in an open field. You'll never stop until you cross the goal-line, 179 pages away. The book is more than an open sesame to the life of the famous coach. It is also the story of Illinois football, of Red Grange and of the University itself. The devotion of player and coach, their loyalty to the University and the University to them is the heart beat of the text.

It is only fitting on Zuppke's 25th anniversary season that the famous redhead play Boswell to him. As Red  
(Concluded on page 30)



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states in the preface, "This is a book which should have been written many years ago. That I should attempt it ... seems right. Robert Zuppke made me in football."

Simply and sincerely Grange paints a word picture of "my coach"—Zuppke the artist, philosopher, speaker and teacher. We find that the Illinois coach invented the huddle, quarterback strategy maps ("The most comprehensive guides . . . I have ever seen."), the screened pass and plays such as the "Flea Flicker," "Blue Eagle," "Corkscrew," "Whoa Back," and "Flying Trapeze." Forward and lateral passes were part of his repertoire as far back as 1906. So effectively did he develop the screened pass that the rules makers were forced to legislate it out of the game.

No book on Illinois football would be complete without a chapter on Red Grange, the greatest Illini of them all. Chapter 11, The Red Grange Era, is contributed by George Dunscomb, a gentleman who has collaborated many times with Grange on newspaper and magazine articles. Grange's incredible ground-gaining records still stand, and will stand forever according to Dunscomb.

The book is illustrated with pictures of Illinois championship teams and men who played vital roles in Illinois football history. Several of Zup's paintings are also shown. If you'd like to have a couple, the Rembrandt of the Prairies will gladly swap 'em for a pair of 210-pound tackles, or perhaps another red-thatched thunderbolt like that Grange man.

**PRIMITIVE AND PIONEER SPORTS.** By Bernard S. Mason. Pp. 342. Illustrated—free-line drawings. New York: A. S. Barnes Co. \$2.50.

**I**N KEEPING with the trend toward the colorful and imaginative in the present-day gymnasium and playground, Bernard S. Mason, editor of *The Camping Magazine* and half of the famous team of Mason and Mitchell (authors of "The Theory of Play," "Active Games and Contests" and "Social Games for Recreation"), presents a long list of individualized activities on picturesque primitive and pioneer sports that fairly teem with glamour and intrigue.

Mason divides his volume into three sections—The Bushman's Section, The Cowboy's Section and The Woodsman's Section. In the first section, he describes the method of making and throwing such types of boomerangs as the cross-stick, pin-wheel, Australian, etc. The second division of the book (cowboy section) is devoted to ropes and whips. He takes up rope spinning, trick knots, lariat throwing, roping exhibitions and contests, whip cracking, and spinning the serpent.

The material is presented exceptionally well. The free-line drawings that are used to illustrate the technique of the various activities are excellent. Counselors, recreational leaders, and camp and playground directors should find this book right up their alley.

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Time	5.00	None
Woman's Home Companion	1.00	None

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## From the States

(Continued from page 13)

conducted by Ed Heidbreder of Hermann, with contributions by Harry Estes, Rolla; Grant Perkins, Steelville; and Ed Potter, St. James.

The Kirksville district reported the election of the following officers: president, Fred L. Spees of Novelty; vice-president, Carl Noble of Kirksville; and Gene Greening of Memphis, secretary-treasurer.

C. E. POTTER,  
Missouri Coaches Assn.,  
St. James, Mo.

### New Jersey

#### Bloomfield unbeaten again

WITH only a scoreless tie with Belleville to mar its record, Bloomfield High School is winding up its third consecutive unbeaten season. The remarkable thing about this team is not its system or outstanding individual players, but the soundness of their simple "T" formation attack. Bloomfield tackles savagely, blocks efficiently and has a spirit that is hard to beat.

Boys interested in football at Bloomfield get their fundamentals back in the last grades of the grammar and junior high schools. Coach Bill Foley sticks to good, sound, basic fundamentals and firmly believes that the only way to gain ground is to run straight ahead; he never fears a team that "razzle-dazzles" the ball, as he calls a lateral passing game.

Other top notch high school teams in the state include Columbia of Maplewood, South Orange, coached by Phil Marvel, and New Brunswick under Chet Redshaw. All three have been undefeated in Class A competition.

The North Jersey Branch of the National Assn. of Approved Basketball Officials have already held four interpretation meetings and expect to hold another on Dec. 10 at Newton High School. The annual examination for new candidates will be conducted at the Newark Y.M.C.A.

CHARLES J. SCHNEIDER,  
New Jersey H. S. Coaches Assn.,  
Newark, N. J.

### Wisconsin

#### Five-sport clinic

OVER 800 coaches attended the Coaches Assn.'s monster five-sport clinic in Milwaukee during the state teachers' convention. R. T. Cook of Williams Bay opened the program with moving pictures of six-man football that covered various types of offense and defense.

This was followed by an actual demonstration of how to teach boxing by Johnny Walsh, Wisconsin University boxing coach. Walsh demonstrated the fundamental stance, offensive punches and defensive blocking. Coach Harry Stuhldreher of Wisconsin gave a run-

ning comment on pictures of the Wisconsin-Marquette football game, and a round table discussion followed on track, basketball and hockey.

The piece de resistance of the evening, the Converse Rubber Co.'s basketball film, concluded the program. Coaches from Stanford, Notre Dame, Pittsburgh, Kansas, and also "Chuck" Taylor discussed and illustrated plays on offense and defense, and drills for developing skills in passing, shooting and guarding.

L. A. ERICKSON,  
Wisconsin H. S. Coaches Assn.,  
Shorewood, Wis.

### Texas

#### Football champions

SIXTEEN schools were crowned district champions in the Class A division of Texas on Nov. 27. A state champion will emerge from this group. The late-season favorites are: Amarillo (champions of 1934, '35 and '36), Abilene, Highland Park of Dallas, Longview, Conroe, Temple, and Corpus Christi.

Forty-four Class B schools won district honors and will continue to play until a regional champion is determined. Each region consists of four districts. Class C teams concluded their schedules on Thanksgiving, 18 teams winning district laurels.

Class A schools have enrollments

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ON PAGE 32 OPPOSITE THIS SPACE ARE  
OTHER LISTINGS AND FORM FOR SIGNATURE

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Manual for Functional Football, by John DaGrosa, \$5.

Functional Football, by John DaGrosa, \$3.

Practical Football, by H. O. Crisler and E. E. Wieman, \$3.

Kicking the American Football, by Leroy N. Mills, \$2. (revised edition.)

The Trainer's Bible, by Dr. S. E. Bilik, \$2.50.

Winning Football, by Bernie Bierman, \$2.50.

Zuppke of Illinois, by Red Grange, \$2.

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Michigan's Offense, by Harry Kipke, \$1.50.

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exceeding 500. Class B consists of schools with 150 to 500, and Class C schools have less than 150 students.

The basketball season will open in January and end with a state championship tournament at the University of Texas in March. Every school regardless of enrollment competes for the championship, beginning with county eliminations. From 12 to 16 counties make up the average district. These county champions then play off for the district title. Four district winners will meet in a regional tournament to determine the teams to represent the eight sections at the state finals in Austin. Last year's champions, Carey, come from a high school of less than 100 students.

J. G. GOOBER KEYES,  
Texas H. S. Football Coaches' Assn.,  
Lubbock, Tex.

## Interscholastic Swimming Coaches Association of America

### Fort Lauderdale clinic

MANY of the outstanding swimming men in the country will lecture at the annual swimming clinic in Fort Lauderdale, Fla., during the Christmas recess. A partial list follows: Bob Kiphuth of Yale, Matt Mann of Michigan, Dave Armbruster of Iowa, Jim Reilly of Rutgers, Mike Peppe of Ohio State, Jack Persons of Duke, Al Gordon of Fort Lauderdale, and John Miller of Mercersburg, president of the Association.

Separate programs are being prepared for the men's intercollegiate, women's intercollegiate and the interscholastic divisions.

At the joint meeting of the swimming officials and Coaches Assn. of New Jersey in Newark, the program committee was exceptionally fortunate in having as a guest speaker Howard Strepp, a Princeton University alumnus who at present is national aquatic director of Poland.

Competition among the prep schools should be very interesting this year. Blair, Tome, Massanutten and Mercersburg again will be represented by exceptionally strong teams. The brilliant schoolboy swimmer of 1937, David Tyler of Hartford, Conn., High School, is continuing his studies this year at Mercersburg Academy.

North High School of Des Moines won first place at the first annual high school championships of Iowa. Clinton was second and Fort Dodge, third. The meet was held at the Iowa State University under the direction of Charles McCaffree, Jr., former secretary of the Association.

The Ohio state championships will be held at Ohio State University, and the Northern Ohio high school relays are slated for McKinley High School. The individual swimming championships of Connecticut will be contested on March 19.

ALFRED A. NEUSCHAEFER,  
Intersch. Swimming Coaches Assn.,  
Trenton, N. J.

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(See page 31 for other listings)

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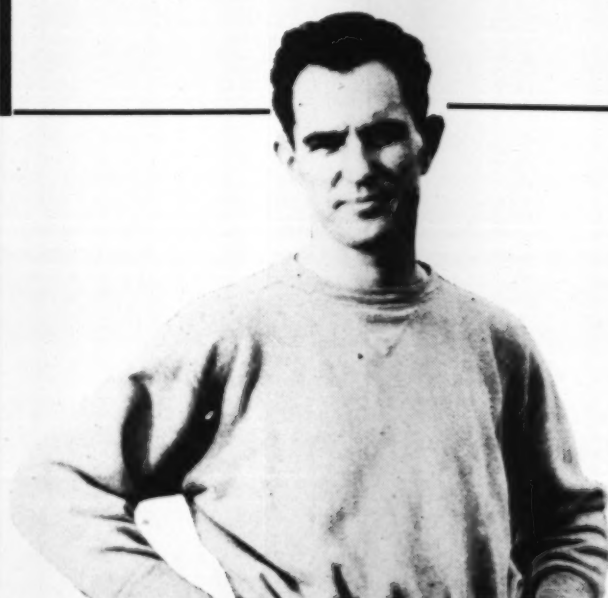
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Basketball Coach  
Stanford University*



THE problem of diets is always a difficult one. It is difficult because of the many cults, theories, phobias, and individual eccentricities with respect to diets. However, in general a balance between the amount of carbohydrates, proteins and fats should be maintained. This should be done regardless of the activity of the individual.<sup>1</sup> According to Dr. Walter H. Brown<sup>1</sup>, head of the Division of Hygiene, Stanford University, who supervises all training table diets at the University, this balance in calories should contain 10-12% protein, 32-40% fat, and 50-58% carbohydrate.

Fortunately, the problem of maintaining a proper diet with young athletes is not a difficult one. They are healthy, vigorous and always hungry. They are eager to do the thing that will help them best to gain their end, namely a place on the team. So, with the proper guidance, they will follow enthusiastically.

The feeding of the Stanford basketball player during training consists of the following basic diet. He may have other food but he must have foods listed below included in his daily diet in order to provide a nutritional balance<sup>2</sup>:

1 quart of milk; 2 servings of fruit—one fresh; rye, corn, or wholewheat bread; 3 vegetables—one must be served raw, as in a salad (one should be leafy, and one a root); potatoes; butter—three pats; eggs—two, alone or in some food; meat (beef or lamb recommended) or fish, once daily; wholewheat cereal, once daily.

The food should be cooked simply. Rich pastries, fried food, or highly seasoned food should be avoided. The normal diet should contain an adequate amount of the bulky, residue-containing foods to insure natural movements of the bowels.<sup>2</sup>

The quantity of food that an individual needs is dependent, in general, upon the weight of the individual and upon his activity. Below are listed different levels of activity. Opposite these are listed the number of calories per pound of weight of the individual that are needed to maintain that level of activity<sup>3</sup>:

Sleeping	-----	.43	calories per pound per hour
Sitting (in class, study, eating, etc.)	-----	.67	" " " " "
Light exercise (slow walking, archery, etc.)	-----	1.10	" " " " "
Active exercise (golf, dancing, tennis, field hockey, baseball, riding, etc.)	-----	1.95	" " " " "
Severe exercise (basketball, football, swimming, boxing, etc.)	-----	3.00	" " " " "

By tabulating the amount of time spent in each of the activity levels in twenty-four hours, one may calculate the energy consumption of the body in calories for a day. Carbohydrates and proteins yield approximately 1800 calories per pound. In fats there are approximately 4000 calories per pound. From this, the amount of food necessary to maintain this level may be determined.

## **References:**

- <sup>1</sup>Brown, W. H. Constructive Hygiene Syllabus. Stanford University.
- <sup>2</sup>Sansum, W. D. The Normal Diet. C. V. Mosby Co. St. Louis, 1928.
- <sup>3</sup>Storey, T. A. Principles of Hygiene. Stanford Univ. Press, 1930.
- <sup>4</sup>Sherman, H. C. Food and Health. Macmillan, 1934.
- <sup>5</sup>Sherman, H. C. Chemistry of Food and Nutrition. Macmillan, 1937.